DOCUMENT RESUME

ED 053 103 SP 005 218

TITLE	Progress in Education Through: Research, Development, Demonstration, Dissemination, Training. Annual Report, Fiscal Year 1968, Cooperative Research.
INSTITUTION	Office of Education (DHEW), Washington, D.C. Bureau of Research.
PUB DATE	68
NOTE	60p.
EDRS PRICE	EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS	Annual Reports, *Educational Development, *Educational Research, *Federal Programs, *Program Administration, *Research Needs

ABSTRACT

This document describes the activities of the Cooperative Research Program of the U.S. Office of Education for fiscal year 1968. The sources of support, administrative framework, and management responsibilities are outlined after which the major features of supported activities are discussed in detail. These include research functions, project and programmatic activities, target group beneficiaries, and educational research facilities. A chapter on highlights of accomplishments provides illustrative samples selected without regard to specific classifications. These examples are organized into three divisions: 1) research and development--those projects and programs which seek to discover or produce information, materials, and practices; 2) dissemination--those activities which make available research and development results for consideration in local settings; and 3) research training--those efforts concerned with developing the human resources for present and future research. A brief concluding chapter considers the present and future needs of educational research. Four appendixes provide additional information on the Research Advisory Council, the research and development centers, educational laboratories and participating states, and the ERIC clearinghouses. (MBM)

HIGHLIGHTS

Cooperative Research is a partnership in which Federal support is provided for educational research and research-related activities conducted outside the Office of Education. This partnership was authorized by the Cooperative Research Act in 1954 and initially funded with $1 million in fiscal year 1957. The Act, as subsequently expanded, was the source of $66.6 million in fiscal year 1968 obligations. Support is used to round out a balanced program of educational research, development, demonstration, dissemination of research results, and training of educational researchers. Funds also are authorized for acquiring, constructing, and equipping educational research facilities.

In fiscal year 1968, more than 800 separate educational research activities, ranging from small projects to a nationwide network of educational laboratories, were supported under the Cooperative Research Act. Highlights follow:

- More than $22 million was given to 20 educational laboratories to further their efforts to create and demonstrate tested alternatives that local educators may adopt to strengthen and advance their programs.
- More than $13 million was provided to support a broad spectrum of research and development center-type activities, including nine centers performing sustained and in-depth research on major teaching and learning problems, two making studies of future educational needs and alternatives, and a group of institutions coordinating their center-type efforts in early childhood education.
- The Educational Resources Information Center (ERIC) network of clearinghouses collected and disseminated educational research information in 19 substantive areas (12 with support from Cooperative Research and the remainder from other authorizations).
- The monthly journal, *Research in Education*, which publishes abstracts of recently completed research and newly funded research projects, indexed by subject, author, and institution, reached a paid circulation of more than 4,500.
- Direct research training was provided for almost 2,300 individuals, 830 in full-time programs and the remainder in institutes and other intensive short-term programs.
- Support for individual research projects totaled more than $21.5 million and provided answers to a variety of educational needs for improved materials and techniques and for achievement and survey information.

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Progress in Education

Through:
Research
Development
Demonstration
Dissemination
Training

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EDUCATION & WELFARE
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A summary of educational research projects and programs administered by the Office of Education, submitted under title IV, section 2(d), of Public Law 89-10.

Fiscal Year 1968 Annual Report
Cooperative Research

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education
Robert H. Finch, Secretary
James E. Allen, Jr., Assistant Secretary and Commissioner of Education
Norman J. Boyan, Associate Commissioner, Bureau of Research

SP005218

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Superintendent of Documents Catalog No. FS 5.212:12043

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON: 1969

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 - Price 60 cents

LETTER OF TRANSMITTAL

Department of Health, Education, and Welfare
Office of Education
Washington, D.C. 20202

May 15, 1969

To the Congress of the United States:

I am pleased to submit the annual report of the educational research and research-related activities carried out pursuant to the authorizations of the Cooperative Research Act (Public Law 83–531, as amended by title IV of Public Law 89–10 and title I, part D, of Public Law 89–750), for the fiscal year ending June 30, 1968. The report is transmitted in accordance with the requirements of title IV, section 2(d), of Public Law 89–10.

The major focus of the report is on the educational research, surveys, and demonstrations, the information disseminating activities, and the research training receiving Cooperative Research support administered by the Office of Education's Bureau of Research. However, to place these activities within the context of the Office's total support for educational research, the report also includes general information about activities funded under other authorizations for research and related activities.

Respectfully,

James E Allen Jr.

James E. Allen, Jr.
Assistant Secretary for Education
and
U.S. Commissioner of Education

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INTRODUCTION

The primary objective of educational research activities is to find or develop the means by which teaching and learning can undergo qualitative improvement. To this end, the Office of Education supports projects and programs to (1) advance knowledge about learning, instructional practices, and the educational system and its relation to the larger society which it serves; (2) translate that knowledge into development of validated practices, techniques, materials, equipment, and organizations; (3) disseminate the results of these efforts to educators and the public, and (4) train researchers who will facilitate continuous educational improvements in the future.

The Office's research program is predicated on the assumption that improvement of teaching and learning inevitably involves decisions and choices from among known alternatives. The purpose of research, therefore, is to improve the alternatives from which to choose and the precision with which choices can be made. Systematic pursuit of these goals requires an equitable distribution of the research investment to satisfy present and future needs. This implies a balanced effort to improve current services and to produce the resources for continuous future improvements. The former looks for immediately useful results; the latter works toward long-range objectives. Both must continually protect freedom of movement so that today's commitments are steppingstones to tomorrow's improvements. At the same time, the back-and-forth communication between researchers and practitioners must motivate and nourish their mutual efforts to improve education.

SOURCES OF SUPPORT

The use of Federal support for systematic educational research was started with about $1 million in salary and expense funds to implement the Cooperative Research Act in fiscal year 1957. In the decade that followed, the Act was expanded, other research authorizations were added, and appropriations were increased. (See table 1.)

In fiscal year 1968 the Office of Education obligated approximately $100 million of Federal funds for research, development, and dissemination activities. The basic source of this support was the Cooperative Research Act (Public Law 83–531, as amended by Public Law 89–10). It authorizes awards for research, surveys, demonstrations, and dissemination; for constructing, equipping, and operating educational research facilities; and for developing and operating educational research training programs. The $66.56 million obligated from Cooperative Research appropriations was about two-thirds of all the Office's funds for extramural educational research. The remainder was from specialized provisions for foreign language development research and studies (title VI of Public Law 85–864), educational media research and dissemination (title VI of Public Law 85–864), vocational education research and training (Public Law 88–210), library research and development (Public Law 89–329), foreign currency financed research (carryover funds from Public Law 83–480), and education of handicapped children research and demonstration (Public Law 88–164) and related research on captioned films for the deaf (Public Law 87–715).

Obligations for educational research in fiscal year 1968 were considerably below appropriations because they were limited by governmentwide restrictions imposed on use of funds during the last half of the year. To comply with the general restrictions, it was necessary to reduce the support level of some ongoing projects and programs and to forgo some whole segments of planned research, development, and dissemination. Because of these limitations, expenditures in four of the eight research authorizations were held at a point even below that for the previous year.

Table 1.—Federal Investment in Educational Research and Related Activities From Legislative Authorizations Administered by the U.S. Office of Education, 1957–68[1]

(Obligations in millions of dollars)

Legislative authorizations	Fiscal years											
	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968[2]
Cooperative Research Program, Public Law 83–531 as amended	1.00	2.31	2.67	3.20	3.36	4.64	6.98	11.50	15.84	50.69	57.64	66.56
Language Development, Research and Studies, Public Law 85–864, title VI			2.39	4.01	1.98	2.00	1.80	1.82	2.55	2.79	3.09	2.93
Media Research and Dissemination, Public Law 85–864, title VII			1.60	3.07	4.73	4.75	5.00	5.00	4.96	3.85	4.37	3.72
Foreign Currency Financed Research, Public Law 83–480					.02	([3])	.01	.39	.22	.56	.51	.22
Research component of Captioned Films for the Deaf, Public Law 87–715 amendment to Public Law 85–905							.11	.20	.25	.30	.45	.65
Education of the Handicapped: Research and Demonstration, Public Law 88–164 as amended								1.00	2.00	5.99	8.09	10.79
Vocational Education Research and Training, Public Law 88–210, sec. 4(c)									10.26	17.14	9.97	13.00
Library Research and Development, Public Law 89–329, title II B											3.38	2.03
Total	1.00	2.31	6.66	10.28	10.09	11.39	13.90	19.91	36.08	81.32	87.50	99.90

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[1] Authorizations listed in order of funding. [2] Limitations on use of appropriations held expenditures below 1967 on four authorizations. [3] Less than 0.01 million.

Source: Data through fiscal year 1966 from Grants-in-Aid and Other Financial Assistance Programs Administered by the U.S. Department of Health, Education, and Welfare, 1967 edition; data for 1967 and 1968 from Budget Estimates, except Foreign Currency Financed Research, and research component of Captioned Films for the Deaf, which are from program records.

ADMINISTRATIVE FRAMEWORK

The Bureau of Research administers most Office of Education support for research programs conducted by individuals and groups outside the Office. The exceptions are captioned film research and education for handicapped children research, which were transferred to the Bureau of Education for the Handicapped when it was established in 1967, and foreign language research and foreign currency financed research which were transferred to the Institute of International Studies when it was established March 27, 1968. All research support programs in the Office of Education are serviced by the Research Analysis and Allocation Staff (RAAS) in the Bureau of Research, and a standard procedure is used for all applications.

Because Cooperative Research is the largest and most flexible of the authorizations, its administration carries the responsibility for rounding out a comprehensive overall program. Some of the research components are specified in the appropriation language and budget authority estimates. Within this framework, supported projects and programs represent a continuous response to educational improvement pressures.

MANAGEMENT RESPONSIBILITIES

Whereas the Bureau's staff carry out the day-to-day responsibilities for administering research authorizations, a 12-member Research Advisory Council (RAC; see appendix A), appointed by the Secretary of the Department of Health, Education, and Welfare, meets regularly to review policy, programs, and procedures and to advise about budget requests and proposed allocation of funds. In addition, a roster of nongovernmental specialists is drawn upon for outside consultative assistance and proposal review. All of these—RAC members, consultants, and field readers—provide a valuable link in determining how available Federal research support can produce improvements in the schools and colleges.

Proposals (applications for support) follow a standard format coordinated to serve all authorizations. The RAAS screens incoming proposals to determine whether they are educational research or research related. Those eligible are sent to appropriate staff units where project officers serve as liaison between the initiator and the Office while the proposed activity is reviewed and evaluated outside the Office by nongovernmental research and development specialists. Criteria include educational significance; soundness of design, procedure, or plan; adequacy of personnel and facilities; economic efficiency; and other specific criteria, as appropriate. Selection for support is determined by the intrinsic merits of the activity and by certain external factors which include the adequacy of available and anticipated research support and the need and pressure for specific research and development products.

Under stringent budgets, there is a continual tension between demands for project and program support. A project is defined as a self-contained activity or set of activities with a few well-defined objectives that can be carried out in a specified time. A program concentrates continuous attention and resources on a specifically announced educational area over an indefinite period. Thus, project research permits a viable, self-renewing approach to educational improvement through combinations of discrete studies and exploratory efforts, while programmatic activities carry on sustained investigations or services over an indefinite period. Different questions have to be resolved in selecting and monitoring relatively short-ranged projects compared with selecting and monitoring programs which, once established, must continuously adapt to evolving situations. At the same time, management must be aware of interrelationships between supported projects and programs to coordinate elements that complement and supplement each other.

Table 2, which summarizes obligations under the various research authorizations, shows the distribution of Cooperative Research funds for project and program research activities.

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Table 2.—Summary of Obligations for Research and Related Activities Administered by the U.S. Office of Education, by Legislative Authorization: Fiscal Year 1968

Legislative authority	Obligations		Number of activities	
Cooperative Research Program (Public Law 83-531, as amended)		$66,555,162		815
Project research activities:				
General education research and development	$19,062,859		581	
Evaluation and national achievement studies	2,148,619		26	
Statistical studies and surveys	314,000		30	
Program research activities:				
Regional educational laboratories	22,438,732		20	
Research and development centers	10,893,607		9	
Early childhood laboratory system	1,561,500		7	
Pilot centers for policy research	999,105		2	
Educational Resources information center activities [1]	2,348,649		12	
Research training programs	6,164,132		110	
Construction and equipment at laboratories and centers [2]	623,959		18	
Research under other authorizations				
Vocational Education Research and Training (Public Law 88-210, sec. 4(c)) (including project research, State research coordinating units, 20 personnel training institutes, 2 R&D centers, and 1 ERIC clearinghouse)		12,996,475		179
Education of the Handicapped: Research and demonstration (Public Law 88-164, as amended) (including 14 instructional materials centers, 1 R&D center, 1 ERIC clearinghouse, and 119 other research and demonstration activities)		10,794,113		135
Language Development Research and Studies (Public Law 85-864, title VI) (including 2 ERIC clearinghouses, 46 projects, and $550,000 transferred to area centers program)		2,934,203		48
Educational Media Research and Dissemination (Public Law 85-864, title VII) (including 1 ERIC clearinghouse and 24 projects)		3,722,545		25
Library Research and Development (Public Law 89-329)		2,028,935		22
Foreign Currency Financed Research (Public Law 83-480)		219,036		10
Research Component of Captioned Films for the Deaf (Public Law 87-715 amendments to Public Law 85-905)		653,971		28
Total, all obligations		99,904,440		1,262
Funds carried over for future years:				
Cooperative Research Construction and Equipment appropriation balances from fiscal years 1966 and 1967		30,157,482		

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[1] Includes $1,083,481 for central processing, reproduction, and auxiliary services, in addition to support of 12 of the 19 clearinghouses in operation in fiscal year 1968.

[2] From funds available from fiscal years 1966 and 1967 appropriations for educational research facilities.

MAJOR FEATURES OF SUPPORTED ACTIVITIES

Fiscal year 1968 brought evidence of increased maturity in the educational research effort. Table 2 gives information about activities supported under the various authorizations, and tables 3 and 4 summarize data from the Bureau of Research Information Control System (BRICS), showing other details about the kinds of activities and the nature of the beneficiaries. These tables represent a first attempt to apply a taxonomy which is under development for coding activities so that it is possible to determine the relative magnitude of the research investment under a variety of different groupings.

The characteristic which distinguishes these activities from other programs supported by the Office of Education is that educational research must be directed toward findings which are adaptable or transferable to settings other than those in which they are discovered or developed.

Within limitations imposed by appropriations and budget authority, the precise form and substance of these activities is determined by the needs of the educational enterprise, particularly as these needs are perceived by staff and the Research Advisory Council. The more than 1,250 supported activities on which this report is based vary in size from comprehensive educational laboratories and research and development centers to individual small projects which can be completed in

Table 3.—Features of Investments in Research and Related Activities Administered by the U.S. Office of Education, Fiscal Year 1968

($99.9 million = 100%)

	Percent of obligations
By type of institution receiving grant or contract support:	
Colleges and universities	40
Regional laboratories	24
R&D and policy study centers	15
Nonprofit organizations	10
State education agencies	4
Local education agencies	3
Profitmaking organizations	3
Other or combination	1
Total	100
By topical area:	
Not applicable	14
Combination	24
Trends, needs, objectives	7
Schools and school systems and services	9
Education personnel	2
Instructional systems, general	13
Curriculum	14
Computer managed or assisted instruction	3
Television and other media	2
Other instructional systems	1
Social influences in education	2
Learning processes (cognitive)	3
Learning processes (social, motivational)	2
Other learning process research	4
Total	100
By general class of activity:	
Research (basic studies)	10
Development-related research	24
Development and demonstration	46
Evaluation	5
Dissemination	7
Training	8
Total	100
By subject matter field:	
Subject matter field not specifically identified	48
Basic knowledge and skills:	
More than one field, inter- or multidisciplinary	13
Reading, composition, bilingual education, and other language arts	10
Other basic knowledge and skills	2
Academic knowledge and skills:	
More than one field, inter- or multidisciplinary	2
Arts and humanities	2
Social and behavioral sciences	2
Sciences and mathematics	1
Other academic knowledge and skills	1
Occupationally specialized knowledge and skills:	
Trades and industry	7
Social service occupations	1
Other occupationally specialized areas	1
Programs for educational professionals:	
Curriculum and instruction	5
Other programs for education professionals	2
Educational administration	1
Subject matter areas not classifiable above	2
Total	100

a few months with a limited financial investment. Applicants compete for funds on the basis of formal proposals which experts outside the Government have evaluated; selection takes into account the priority needs of education. Continuation support for long-range activities is contingent upon annual review and reassessment in terms of available funds and emerging needs for a balanced total program.

Colleges and universities were the fiscal recipients for more than half of the nearly $100 million research expenditure in fiscal year 1968, followed by educational laboratories and other nonprofit organizations and State and local educational agencies, in that order. Less than 3 percent went to profitmaking corporations for contracted studies and services.

RESEARCH FUNCTIONS

There is no prescribed formula for the relative investment in various functions along the research-development-dissemination continuum.

The functions are not mutually exclusive. They blend into each other and many of the supported activities have elements of several functions.

Research (sometimes called basic studies) includes those efforts to produce *knowledge* needed to improve teaching and learning. Development activities include those efforts to create, produce, or identify materials, practices, or conditions which represent improvements over those currently employed. Demonstration, when treated as a separate function, shows new products in operational settings. Evaluation includes those activities seeking to determine the relative status of existing conditions or the effectiveness of products and programs. Dissemination includes all those efforts to make the results of research and development functionally available to those who can use them. It is broader than demonstration and may include educational engineering to assist localities in bringing about changes of their choice.

Research training, while not part of the research-development-dissemination continuum, has a facilitating function in that it provides the manpower for systematic pursuit of the educational improvement effort. Research facilities, another investment category outside the continuum of research functions, also contribute to research accomplishment by providing equipment and permanent settings for continuous research and development activities.

The classification of activities into these various functions has evolved in the general maturing of the educational research program. For example, in the early days of Cooperative Research, supported activities were largely the basic studies type of research, reflecting the interests of educational researchers of that period. As schools and school systems became more aware of the potential for systematic educational improvement through research, there was a noticeable increase in the proportion of funds invested in applied research. Even so, activities could not always be classified discretely under one function or the other. The more comprehensive activities frequently served multiple functions. It is interesting to note that the word development did not appear in the original Cooperative Research Act and that dissemination was initially specified in the 1965 amendments. Before that time, development and dissemination had to have strong justification against a base of research per se.

Analyses of the 1968 investment in research and related activities show that about 10 percent of the total went for basic studies, 24 percent for development-related research, 46 percent for development and demonstration, 5 percent for evaluation, 7 percent for dissemination, and 8 percent for research training.

By general topical areas, the heaviest investments are in activities related to curriculum and instructional programs and practices, followed by efforts to improve school systems and services, investigations of the learning process, and studies related to trends, needs, and objectives. About a fourth of the total investment was in combinations of the topical areas, again reflecting interrelationships in efforts to improve education. In terms of the instrumental target group—those most likely to use the results for improving the education of students—analyses showed that the chief beneficiaries were instructional and supporting staff, followed by other education professionals.

PROJECT AND PROGRAMMATIC ACTIVITIES

In absolute numbers, most activities receiving Cooperative Research support have been projects in which precisely defined goals can be reached in prescribed times and at stated costs. Support for such activities facilitates early exploration in emerging critical areas and provides flexibility in changing from one area of investigation to another.

Longer-range, programmatic activities concentrate intensive effort on carefully defined areas or services which need continuous attention over an indefinite period. The strong mission orientation of programmatic activities and their ability to build on accumulating experiences and services in their particular areas give these activities key roles in the total research effort. The level of continuation funding for such an activity is determined by regular review and reassessment of accomplishments in relation to total educational research needs.

Continuation research activities

Programmatic support for research, development, and service activities was given a strong stimulus with the establishment of the first research and development centers at the University of Pittsburgh and University of Oregon in fiscal year 1964. These and subsequent centers were to serve as prototypes for other long-term mission-oriented activities, such as the educational laboratories, ERIC clearinghouses, and research training programs. While activities receiving long-term programmatic support are relatively few in total number, compared with those receiving project support, they accounted for about half of the Cooperative Research obligations in fiscal year 1968 and formed major threads of continuity, accomplishment and service in the total research effort. The centers and laboratories are research and development oriented, whereas the clearinghouses and training programs are service oriented.

The nine research and development centers receiving Cooperative Research support in 1968 were investigating the following broad areas: individualized learning, cognitive learning, teaching theory and practice, teacher education, educational administration, the social organization of the school, early and continuous stimulation of learning, higher education, and evaluation of instructional programs and techniques. Through mid-1968, these centers had implemented over 40 interrelated programs involving several hundred specific projects or activities. Completed curriculum sequences included a televised mathematics course, simulation games for social studies, programed instruction in verbal argument, creativity materials, and a beginning reading system. Films, videotapes, and other teaching devices also had been developed.

At the end of fiscal year 1967, program support for an earlier center (on educational differences) had been converted to project support for certain clearly defined activities. Through use of fiscal year 1968 funds, all nine remaining centers were placed on a common funding schedule. This permitted more pointed comparative funding actions and at the same time enabled centers to plan programs, activities, and staffing more systematically.

When fiscal year 1968 activities in these centers are classified by major focus, instructional systems received 30.2 percent of the support; educational personnel, 23.1 percent; organization and administration, 16.5 percent; total institutions, 12.5 percent; student capacities and characteristics, 9.1 percent; home and community factors, 4.4 percent; and pupil personnel services, 4.1 percent. On another grid, according to levels of education, 33.6 percent was expended for elementary and secondary education (combined); 20.9 percent for secondary; 13.2 for middle schools; 10.5 for early education; 15.7 percent for higher education; and 6.2 for levels not readily classifiable above.[1]

In addition to the nine research and development centers supported by Cooperative Research, two others received funds authorized for vocational education research and training. Cooperative Research also was the source of center-type support for a coordinated group of efforts on early childhood education and for two programs investigating problems in educational decisionmaking for the future. (See appendix B for addresses of research and development centers and center-type activities.)

With the establishment of the regional educational laboratories (see appendix C), the centers have gradually reduced some of their efforts to assist with diffusion of their findings and placed increased emphasis on developing prototypes or working models of innovative materials and procedures. An emerging practice is for centers to carry their activities through preliminary field tests, after which cooperating laboratories take on the responsibility of further adaptation, refinement, testing, and implementation of the activity in the schools.

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[1] *Journal of Research and Development in Education*, summer 1968, p. 201.

Fiscal year 1968 was the first full year of operation for the network of regional educational laboratories. The central mission of the laboratory program is to speed the pace of intelligent application and widespread utilization of promising results of educational research and development. The primary objective is to create and demonstrate a rich array of tested alternatives to existing educational practice, with choice of adoption resting in the hands of local school systems.

The sponsors and architects of the 1965 legislation which authorized support for the laboratory program believed that a new type of institution was required to represent effectively all segments of the educational community where involvement was necessary to produce educational change in quality and quantity. Such an institution was to stimulate a powerful educational partnership of individuals and agencies with a wide variety of jurisdictional responsibilities and to tie research and development more closely to classroom practice.

To this end, local initiative resulted in the founding of 20 regional educational laboratories between February and September 1966. Each represents the combined planning of individuals from State departments of education, public and private schools, colleges and universities, schools of education, and industrial and cultural organizations, who would know the educational problems of the area. Following a developmental period, each laboratory became an independent nonprofit corporation with its own governing board, management, and staff, capable of making decisions regarding specific program objectives, attracting the resources (personnel, funds, and facilities) necessary to realize those objectives, and directing the operations by which those objectives would be attained.

The primary activities of the laboratories fall under the heading of educational development—a demanding, exacting, time-consuming, and expensive process. Development involves precise formulation, field testing, and refinement of materials, procedures, and organizational forms for adoption and adaptation in the schools. The educational laboratories are responsible for insuring the demonstration of "products" they have developed, adapted, or identified, and for securing the involvement of other groups whose participation is essential in the diffusion of these products. The ultimate test of laboratory efforts is their demonstrated effect upon the improvement of school practices.

General accomplishments of the regional educational laboratories for fiscal year 1968 are characterized by increased clarification of function and precision in program definition, by movement from program formulation to program implementation, and by increased cooperation with other institutions. As the mission of the regional educational laboratory program has taken on firmer shape and content, the laboratories have come to increased agreement that educational development represents the keystone in the arch of activities connecting the production and the utilization of knowledge about teaching and learning.

The development carried on by the laboratories has been heavily weighted toward adaptation for school use, whereas development in the centers has been weighted toward creation of new knowledge and new programs and practices.

Research and development centers in fiscal year 1968 were also responding to demands for a greater proportion of development-oriented research as compared with conclusion-oriented research. This increased commitment to the immediate needs of education led to more precise definition of objectives by both centers and laboratories. It also led to reformulation of some of their program designs for more direct relevance to specific educational development needs. At the same time, both centers and laboratories have tried to avoid short-range expediencies which might impede long-range progress.

There is no one single model which laboratories or centers follow. Each is encouraged to vary its emphasis on development, demonstration, and diffusion activities. In fiscal year 1968, every laboratory had at least one major program in the implementation stage and all were working in school sites on the educational developments which they proposed to carry through to completion. In addition, a substantial number of efforts had been brought to the stage of initial or later pilot testing, and others had been brought to the state of initial demonstration. Plans also were under way to attempt a major national demonstration of Individually Prescribed Instruction through interlaboratory collaboration led by Research for Better Schools, Inc., Philadelphia.

At the same time that laboratories and centers have been responding to demands for large-scale continuous research and development, other elements of the total research effort have been responding to the needs for diversity, for exploration of new areas, for developments to meet currently critical needs, and for a wide variety of dissemination and demonstration to help the schools evaluate the alternatives from which they must choose. It therefore has become increasingly critical for laboratories and centers to coordinate their planning with other research and development efforts so that results are mutually reinforcing.

By the end of the fiscal year, the level of anticipated funding was forcing extremely critical decisions to determine how to spread restricted resources. Because of continued shortages in available support, the decision was made in fiscal year 1969 to continue the 15 strongest laboratories at approximately their 1968 level and curtail Federal support for the remaining five because of lack of funds.

Just as the continuity assured by programmatic support lends strength to the research and development efforts of the centers and laboratories, so it lends depth and stability to the services provided by clearinghouses in the Educational Resources Information Center (ERIC) system and by major research training programs. By fiscal year 1968, clearinghouses had been established for continuous dissemination responsibilities in 19 substantive areas (see appendix D), and graduate level research training programs were being carried out by 68 institutions in 26 States. All of the training programs used Cooperative Research support, as did 12 of the clearinghouses. Funds from other authorizations were used for the other clearinghouses and for certain other programmatic activities, such as the instructional materials centers for education of the handicapped and the State vocational education Research Coordinating Units.

Each clearinghouse was initially established at a university or association where there already was a substantial collection of materials in the particular substantive area and where staff have continuing interest in accumulating valuable resources and providing related services to users of those resources. Clearinghouse staff receive and process documents, provide appropriate analyses for use in answering requests from their constituents, assist in general and specific reference searches, and feed document information into Central ERIC to be reported in the abstract journal, *Research in Education.* Central ERIC in turn coordinates the activities of the clearinghouses and related technical services, such as arrangements for document reproduction.

In research training activities, programmatic support was used for the continuous career programs, and project support for short-term intensive programs and special projects. A typical career program offers professional training up to 3 years in duration at the graduate level and generally culminates in an advanced degree with specialization in one or more specific kinds or areas of educational research.

The same fund limitations which forced restrictions on programmatic research and development activities also placed restraints on service activities receiving programmatic support. For example, substantive areas of some clearinghouses were rearranged in lieu of adding clearinghouses in additional areas, and the number of graduate participants in research training was held constant even though most of the institutions added the last year to their planned 3-year training programs.

Limited time activities

Whereas activities receiving programmatic support provide continuity for research and development in major areas and depth and stability for uninterrupted services, projects and other limited time activities provide flexibility to shift support in order to investigate emerging critical areas and round out a balanced total program. The limited time element also makes project support appropriate for initiating pilot efforts where continuation support may later be taken over locally. For example, local funding is taken over by State agencies for vocational education Research Coordinating Units and by member colleges of consortiums which use research development grants to build their own capabilities for objective self-improvement.

Depending upon the procedures to be carried out, the time and cost limitations for a given project are determined by the activity itself and stated in the grant or contract document. Regional (small) project research and research development grants have specific limitations, but regular projects vary widely in time and cost, depending upon what is needed to accomplish their objectives. When funds are drawn from more than one year's appropriations, the level of continuation funding is contingent upon reevaluation of the activity in light of new appropriations and pressures for available support.

Out of the more than 1,250 new and continuation grants or contracts receiving fiscal year 1968 support from authorizations for education research and related activities, more than 1,050 had definitely specified time and cost limitations. For Cooperative Research, which carries the major responsibility for rounding out the total program, projects numbered 736 out of 815 supported activities (see table 2). Depending upon what each project proposed to do, the time-cost element ranged from brief studies which could be completed in a few months with all funds out of the current year to comprehensive studies which require as much as 5 years for completion and are funded in annual segments.

What distinguishes longer projects from programmatic activities is that, from the outset, they are directed toward specified outcomes instead of toward carrying on continuous investigation or service. The National Achievement Study, for which $1 million was specified in the 1968 budget authority, is one such project. It will secure measures of educational attainment in the fields of citizenship, literature, science, social studies, writing, mathematics, music, reading, art, and vocational skills. The first cycle will yield comprehensive baseline measures of attainment; the next cycle, through comparison with the first, will yield measures of progress. Data will be drawn from scientifically selected samples to provide attainment measures by age, sex, socioeconomic levels, and other stratifications which make up the total enrollment, but the results will not be appropriate for measuring one school or one school system against another.

Some of the other comprehensive projects were in the areas of curriculum improvement where content needed to be developed and sequenced for the whole educational continuum. In contrast, some small curriculum improvement projects developed or pilot tested single courses or segments of content which may later be coordinated into more comprehensive curriculum developments.

Obviously, the management of research funds must take into account the way small and large projects fit together, with each other and with activities being carried out in the laboratories and the centers, to produce the variety of research findings needed by the whole educational enterprise.

The Regional Research Program was established in fiscal year 1967 to encourage broad participation in research activities, facilitate prompt consideration of small project proposals, bring negotiation and other services closer to those carrying out the research, and help match research efforts with needs of the region. In fiscal year 1968, $2.9 million in allocated funds was used by the nine OE regional offices to support the small project research and research development grants administered in this program.

Small projects broaden research participation by providing up to $10,000 for significant small-scale projects which can be completed in no more than 18 months. Research development grants provide up to 3 years of limited support for organized groups of colleges to improve their research capabilities and develop their research orientation in teaching and learning practices. Regional administration facilitates proposal processing and monitoring of projects, and encourages graduate students and small colleges to compete for regionally allocated support. The 20 ongoing research development grants in 1968 involved 128 colleges and universities. Five consortiums were in the third and final year of activity and the remainder were beginning a second year. The severely curtailed budget was barely sufficient to meet continuation costs, and no new grants were made.

Almost 1,000 unsolicited small project proposals were received and processed in fiscal year 1968. Of these, 263 were approved and supported, almost all of them out of Cooperative Research funds. Because of spending restrictions imposed near the close of the year, another 85 which were approved were carried over for reconsideration in fiscal year 1969.

Research clinics, workshops, review of draft proposals, and personal consultation were used to help raise the quality of proposals from institutions defined as "research small," or those receiving $20,000 or less of support administered by the OE Bureau of Research. While common criteria continued to be used for proposals from all institutions, the proportion supported from "research small" institutions shifted from 15 percent in fiscal year 1966, to 19 percent in 1967, and almost 24 percent in 1968. However, because this has not been accompanied by budget increases as anticipated, the changes have been made at the expense of large university support within the Regional Research Program.

THE SUBSTANCE AND TECHNIQUES OF INSTRUCTION

Basic knowledge and skills accounted for about half of the 1968 investment in activities which could be classified according to specific subject-matter field. (See table 3.) The other half was about equally divided among academic knowledge and skills, occupationally specialized knowledge and skills, and programs for education professionals.

A large segment of the investment in studies involving basic knowledge and skills was in activities concerned with multidisciplinary learning. Another large segment went into language arts areas. The substantial amount going for studies related to bilingual education and English as a second language reflects efforts to cope with a currently critical area.

There is no established set of categories for classifying activities according to the way they fit into the instructional system. An attempt to identify investments in key topical areas shows substantial investments in curriculum improvement, followed by studies on instructional systems, the use of computers and other media, and studies related to learning processes.

The potential for educational improvement is a criterion built into the selection process of every proposal. Dissemination and diffusion of results are the continuing responsibility of the Educational Resources Information Center, the laboratories, and the Targeted Communications Program. Research training programs to upgrade research skills and prepare new researchers are helping to provide the human resources needed to identify or develop the means for further improvements. With the establishment of two centers to research strategies for future educational decisionmaking in the schools, another element is added to the effort to make present research serve future needs.

TARGET GROUP BENEFICIARIES

Students are the ultimate beneficiaries of effective educational research and related activities. Even for those activities designed to improve curriculum materials, school administration, or training of education professionals, the ultimate beneficiaries are the students.

Table 4 shows results of classifying all project and program activities according to identifiable characteristics of target groups. Where these characteristics are not specifically identified, it must be assumed that beneficiaries are representative of the general student population. The significant figures from table 4 are for those categories identified specifically enough to suggest areas of emphasis over and above that likely to be included in more general programs. For example, by demographic area of ultimate target group, about 87 percent of the total research investment was to

Table 4.—Characteristics of Ultimate Target Groups Benefiting from Supported Research Activities, Fiscal Year 1968

($99.9 million = 100%)

	Percent of obligations
By developmental or educational level:	
All levels (or level not identified)	43
Early childhood and preschool, not further specified	14
Birth through kindergarten	1
Primary (through grade 3)	3
Elementary, not further specified	10
Later elementary through junior high school	3
Elementary and secondary, not further specified	10
Secondary	5
Postsecondary, not further specified	5
Higher education	3
Adult education	1
Occupation specialized	1
Articulation between levels	1
Total	100
By demographic area of ultimate target group:	
All areas (or area not specifically identified)	87
Urban, not further specified	8
Central city and urban fringe	1
Rural	4
Total	100
By special characteristics:	
All students (or characteristics not specifically identified)	73
Intellectually gifted	1
Physically handicapped, not further specified	2
Vision handicapped	1
Speech and hearing handicapped	2
Intellectually handicapped, not further specified	2
Culturally deprived (socioeconomically disadvantaged)	15
Retarded	1
Emotionally disturbed, underachievers, dropouts, migrants	1
Foreign language speakers	1
Other special groups	1
Total	100
By ethnic, racial, or cultural characteristics:	
All students (or characteristics not specifically identified)	91
Minority groups, not further specified	6
Negro	1
Indian	1
Other minorities, including Mexican-American	1
Total	100

improve education for the general student population, but 9 percent was primarily or exclusively for students in central city or urban areas and 4 percent for those in rural areas.

By ethnic, racial, or cultural characteristics, investments specifically focusing on the education of minority groups were about 9 percent of the total. Two-thirds of this was for minority groups not further specified. Negro, Indian, and Mexican-Americans were the primary beneficiaries of most of the remaining funds.

Because grade combinations differ widely from one locality to another, it is difficult to classify the developmental or educational level of the ultimate target group. The investment going for early childhood and preschool education (about 15 percent of the total) reflects the growing recognition that much of a child's later learning is conditioned by what happens during the early years. Other specific levels that received substantial research investment were the primary grades and junior high school.

Special characteristics of students may be accommodated through separate programs, or through attention to individual differences in heterogeneous groups, depending upon staffing and the kind and degree of special characteristics involved. About a fourth of the total research investment went for studies in which the special characteristics of the ultimate target group could be identified. Of this amount, more than three-fifths went for groups identified as culturally or intellectually handicapped and more than a fifth for those with physical handicaps. Other identifiable groups included foreign language speakers, emotionally disturbed students, and the intellectually gifted.

When investments were classified according to instrumental (as distinguished from ultimate) target groups, amounts for studies benefitting instructional and supporting staff accounted for the largest total investment. Many of the activities involved several instrumental target groups so that selection of the primary one could not be precise.

EDUCATIONAL RESEARCH FACILITIES

During fiscal year 1968, $615,000 was awarded to laboratories and centers for the kind of research facilities support authorized by amendments to the Cooperative Research Act. In keeping with imposed spending limitations, more than $30 million was carried over for future years from balances appropriated in fiscal years 1965 and 1966.

Some $505,000 was awarded for purchase of major program-related equipment items. Among these were videotape recording systems for collecting classroom behavior examples in conjunction with teacher training programs, motion picture production units for creating classroom demonstration films, and data processing equipment to assist in analyzing research information or in implementing computer-assisted instruction efforts. Two laboratories and a research and development center also sent in major proposals for computer acquisitions, and these were under review at the close of fiscal year 1968.

A major facilities grant of $110,000 was awarded to the University of Wisconsin to support advanced planning for their Research and Development Center for Cognitive Learning and related research activities. The Learning R&D Center at the University of Pittsburgh also had been invited to submit a proposal for support of a research facility. Their application received provisional approval of a grant to be awarded during fiscal year 1969.

HIGHLIGHTS OF ACCOMPLISHMENTS

Classifications of research investments, as shown in the previous section, are as overlapping and interrelated as the questions educators ask. To show the scope of accomplishments from these investments, illustrative samples have been selected without regard to specific classifications.

To simplify the report, examples have been organized into three useful divisions: (1) research and development—those projects and programs which seek to discover or produce information, materials, and practices; (2) dissemination—those activities which make available research and development results for consideration in local settings; and (3) research training—those efforts concerned with developing the human resources for present and future research.

RESEARCH AND DEVELOPMENT

At the end of fiscal year 1968, staff responsible for project and program administration coded all supported activities according to several sets of relevant dimensions (see tables 3 and 4). The results showed that, out of the nearly $100 million total, 85 percent was invested in all forms of research and development, including related demonstration and evaluation.

To avoid excessive stratification, this section combines research and development examples under four arbitrary subdivisions: student learning, instructional programs and practices, curriculum content improvement, and school management and services. Activities which could be treated under more than one area are fitted in wherever appropriate. Demonstrations and evaluations also are included in this section if they are related to the research and development effort. Dissemination and research training examples are reserved for subsequent sections.

Student learning

The student is the medium through which each generation transmits its most priceless heritage: the education needed to make the future better than the past. The characteristics of individuals, whether determined by nature or by environment, play an important part in determining what, how, or whether students learn at various stages of their development. This is true with special groups, such as the disadvantaged or the handicapped. It is also true for all students at the various age or grade levels.

Special groups

Certain groups, because of their backgrounds or physical characteristics, require educational treatments different from that of typical students. Part of the research investment, therefore, has been used to identify the learning problems of these students and develop appropriate programs and practices to accommodate their learning needs.

Table 4 shows the relative magnitude of investments in which the special characteristics of students could be identified. For example, more than 5 percent of total obligations went for activities involving the physically handicapped, almost 18 percent for the culturally and intellectually handicapped, and less than 1 percent for the intellectually gifted. On another classification, about 9 percent of the total investment went for studies in which minorities were the ultimate target group. There is no way to determine how much the education of special populations may benefit as a result of research and development to improve education for the general population.

Educating the disadvantaged.—Improving the education of the disadvantaged has been one of the major priority areas of the fiscal year 1968 investment in research and development. Specifically identifiable activities in this area included about $14.5 million to improve the education of the culturally deprived, and $.4 million for dropouts, truants, delinquents, and other underachievers, many of whom were disadvantaged. Numerous general projects and programs had elements on the disadvantaged, but the portion of funding for these elements could not always be determined. Such elements were frequently found in programs for the physically or intellectually handicapped and for foreign language speakers.

Most studies on minority groups dealt with their economic and cultural disadvantagement as did most studies on education in the central city. The examples which follow indicate the scope of activities in this priority area.

Almost all of the educational laboratories have identifiable programs concerned in some way with education of the disadvantaged. In 1968, the Southeastern Education Laboratory (SEL), Hapeville, Ga., used demonstration sites in 24 schools to test new ways for instructing disadvantaged students and mobile units in six school districts to evaluate a preschool instructional program for rural isolated children. Improved communication skills and interpersonal relations have been the primary goals. Videotaped recordings of classroom sessions were used to identify emotional and cultural barriers to effective communication, and existing language curriculum materials were analyzed to determine where materials need to be adapted or developed. SEL also maintains a Bilingual Materials Center in Miami, with supplemental funds from other Government agencies.

The Southwest Educational Development Laboratory (SEDL), Austin, carried out a staff development program in which potential teachers of the disadvantaged learned to analyze their teaching performance, diagnose learning problems, and design problem-solving approaches. This was part of the laboratory's concern for education of minority groups.

The culturally disadvantaged were the beneficiaries of the 1968 early childhood education work of the South Central Region Educational Laboratory (SCREL), Little Rock, Ark. Initial emphasis was placed on improving basic skills and self-concepts of three populations in the region: the Negro of the Mississippi Delta; the rural poor of the Ozarks; and the nonreservation Indian of Oklahoma and Arkansas.

The laboratory continued to develop, field test, and demonstrate three kinds of model programs: home-school coordination, compensatory preschool work, and programed instruction for early childhood education. In the absence of kindergartens throughout the region, the home-school coordination program tested the feasibility of a Saturday school in which Ozark parents and their children learned to carry out home projects. Cherokee Indian parents and their children participated in a bilingual program.

The compensatory preschool program had three elements. One evaluated achievement of culturally disadvantaged children enrolled in a socially integrated private kindergarten. Another developed a curriculum to compensate for perceptual learning disabilities common to many children of poverty. The third field tested cultural enrichment and diagnostic teaching approaches for rural Ozark children.

Programed instruction methodologies were field tested by SCREL in rural Mississippi schools to improve use of standard English by pupils with dialectical speech patterns, and computer-assisted instruction (CAI) materials and procedures developed at Stanford University were tried with culturally disadvantaged first-grade children.

Some of the research and development centers also were engaged in activities relating to the disadvantaged. At the Pittsburgh Center, the Primary Education Project (PEP) is concerned with adapting individually prescribed instruction to the urban setting, and projects on responsive environments are developing devices to meet the learning needs of the disadvantaged. At the Johns Hopkins Center, the disadvantaged are the target group for development of a system of social accounts for the American Negro, a curriculum to teach English as a second language, and a number of simulation games activities.

One project, started at New York University in July of 1964 and to be completed in December 1969, has been seeking to reverse the consequences of environmental conditions which lead to failure. An enriched curriculum was provided for 4-year-old children from lower-income families living in overpopulated slum areas of New York City. The object of the study was to compare the consequences of varying periods of this curriculum: preschool only, preschool plus kindergarten, or preschool through first grade.

The Ypsilanti (Michigan) Public Schools, starting in 1964, have been assessing the long-range impact of an experimental preschool program on the intellectual development of functionally retarded and culturally deprived Negro children. The program included cognitively oriented morning sessions at school, afternoon home visits by staff, and regular meetings of parent groups to discuss mutual problems.

Another project, started about the same time at the University of Illinois (Urbana) and scheduled for completion in 1969, has been using another approach to improvement of learning of preschool disadvantaged children. Activities include basic research on the intellectual functioning of the disadvantaged; development of curriculum materials, procedures, and evaluation instruments; dissemination of findings through field demonstrations; and some training of professional personnel for further research and development to improve education of the disadvantaged.

Serving minority student needs.—A variety of activities have been focused on the special needs of minority students and the development of appropriate programs and practices to further the educational advancement of these students. For example, the Southwest Educational Development Laboratory (SEDL), Austin, Tex. is concentrating its efforts on the educational achievement of Mexican-Americans, Negro-Americans, and French-Acadians.

To meet the unique needs of the Mexican-American population, SEDL has designed a preschool program for 3-, 4-, and 5-year-old children which emphasizes the building of self-concepts, the development of cognitive skills, and the development of language proficiency with English introduced as a second language. The laboratory also has been developing a bilingual elementary curriculum in which subject matter in grades one to five is taught in Spanish while the student is in the process of learning English. Support from the Office of Economic Opportunity was provided to develop a companion program for adult Mexican-Americans. In addition to inservice training for experienced teachers, SEDL is developing a model preservice program for college students who plan to teach and counsel Mexican-Americans.

The SEDL program to raise the educational achievement level and aspirations of students has included early childhood education, parent-child partnerships, and staff development. Curriculum materials being developed or adapted involve the children in structured situations which give rise to questions, lead to creative and intuitive thinking, and approach learning inductively. A number of approaches are being refined in the parent-school partnership program to utilize special abilities of participating parents as well as to further the learning experiences of those parents.

Since September 1965, researchers at California State College (Los Angeles) have been developing a reading program for Mexican-American children. Activities stress oral language development, parent participation, and learning how to learn. Children may start at age three, and instruction is highly individualized. Volunteer mothers assist teachers, particularly at the preprimary level.

Among the studies seeking to provide the basis for improving the education of Negroes, one at Harvard is an intensive longitudinal investigation of the options seen by the Negro male adolescent and the influences which determine his choices.

The final report of a Howard University study of interracial attitudes became available in fiscal year 1968. Investigators found that the more contact Negro youths had with whites, the less prejudiced they were, but that physical integration needs to be accompanied by understanding if Negro and white attitudes are to change. A 1968 replication of this earlier study seeks to determine how increased militancy and civil disorder may have affected attitudes, aspirations, and job performance of young people.

Dumbarton Research Council (Menlo Park, Calif.) used 1968 funds for further exploration of the influences of home and school environments and racial composition in the classroom. The project extends and reanalyzes information gathered for a previous study to determine whether significant differences exist between (1) Negroes whose elementary school experience has been exclusively in segregated schools and those whose experience has been exclusively in racially mixed schools; and (2) white children who have attended only all-white schools and those who have attended racially mixed schools.

Investigators at the University of California (Riverside) have undertaken a longitudinal study to determine the effects of integration in a tri-ethnic educational setting involving Negroes, Mexican-Americans, and white children. About half of the 1,800 subjects are from minority groups and the other half white. Data will show changes resulting from desegregation and provide a basis for determining the long-range effects on academic achievement and emotional adjustment. The impact of desegregation on both majority and minority children will be evaluated, and factors which promote achievement and adjustment will be identified. Investigators also will try to determine how the desegregation impact alters family attitudes, values, interaction patterns, and community participation.

A project funded with Ohio State University produced an intensive analysis of all obtainable research on American Indian education. The report covers the history of American Indian education; the problems of Indian education today; and research in eight areas: intelligence, teachers, parents, cultural deprivation, the cultural barrier, the language barrier, the school, and self concepts.

The effects of integration on rural Indian pupils was the subject of a small project study at the University of North Dakota (Grand Forks). Where previous studies had focused almost entirely on achievement, this one examined other factors, such as alienation, social relationships, and attitudinal changes, as well as achievement. Another small project related to Indian education, this one at the University of Colorado (Boulder), received support to validate a measurement of motivational factors which contribute to the classroom success of the Indian as distinguished from motivational factors of others.

A study started at the University of Minnesota (Minneapolis) and later transferred to Johns Hopkins University (Baltimore) has taken a broad historical look at the integration of immigrants into city populations to see what implications are there for today's mobile minorities. The central concern of the study was to discover the ways the educational aspirations of eastern and southern Europeans helped them adjust to demands of an industrial society, and the factors affecting efficiency of education in changing social attitudes, personality structures, and social mobility.

Other studies, too, have been concerned with development of curricular materials needed by minority students. For example, minority children of junior high school age who are reading 2 years below grade level were the beneficiaries of language arts materials developed by Hunter College. The 14 units in literature and related language arts deal with human interest themes, such as families, striving, and justice, and include selections by and about minorities.

Research results at Tufts University (Medford, Mass.) were among the first objective evidence about the biased treatment of race and culture in school textbooks. Materials and strategies developed at Tufts to promote positive self- and group-concepts among school children were used in field settings in 1966–67. In fiscal year 1968, a grant enabled the Lincoln Filene Center to further refine these materials, to supplement them with audio-visual materials, such as films, tape recordings, slides and overhead transparencies, and other resource aids, and to evaluate their effectiveness.

Exceptional students.—The term "exceptional" is generally applied to those students who need special programs to accommodate their particular learning characteristics or problems. In theory, such programs may be for students at either end of the ability spectrum or for students with various kinds of physical and intellectual handicaps. In practice, most of the funds, and hence most of the programs, are for education of the physically or intellectually handicapped. Special abilities at the upper end of the spectrum, no matter how "exceptional," are typically "accommodated" through allowances for individual differences. In some schools, the highly gifted and talented can be accommodated in special programs for the exceptional only if they are emotionally disturbed.

Most support for studies in the area of exceptional children comes from authorizations for handicapped children research and demonstration or the research component of captioned films for the deaf. Some Cooperative Research support also is used for identification and treatment of exceptional learning problems and there is a high degree of coordination to assure that supported activities under all the authorizations complement and supplement each other. Funds from the provision for handicapped children research and demonstration were used in fiscal year 1968 for 14 Instructional Materials Centers (IMC), for an ERIC clearinghouse, and for a variety of research, development, and demonstration projects. The IMC's serve as central depositories for teaching-learning materials, whereas the clearinghouse, located at the Council for Exceptional Children, NEA, is more specifically concerned with research results. The clearinghouse and some of the IMC's supplemented their funds from other sources to include service or materials for the gifted, which would not be eligible for funds authorized for the handicapped. Some of the captioned films support was used for the research component of film development and for related training.

Two examples show how Cooperative Research support was used to improve the education of exceptional students. In fiscal year 1968, results became available from a 2-day conference on dyslexia, held at Southwest Texas State College. The conference recommended that a commission of nongovernmental specialists be appointed to examine this reading problem area, make suggestions for a continuing National program, and develop program guidelines. Such a commission, the Secretary's (HEW) National Advisory Committee on Dyslexia and Related Reading Disorders, was appointed in August 1968, and will make a report to the Secretary in fiscal year 1970 (fall 1969).

The Rocky Mountain Educational Laboratory (RMEL), Greeley, Colo. has been seeking ways to remedy individual learning disabilities of children who have adequate mental abilities and emotional stability but specific deficits in perceptual or expressive processes which severely impair learning efficiency. The goal is to develop techniques for diagnosing and overcoming the disabilities. Most of the work thus far has been concentrated at the second-grade level.

Activities supported out of the appropriations for handicapped children research and demonstration covered a wide range of physical and intellectual handicaps. There also were seven regional conferences to study the significant problems in special education and identify some possible solutions.

Among the project final reports which became available in fiscal year 1968, one from Michigan State University (East Lansing) concluded that the educable mentally retarded has a deficit in learning strategy rather than in learning ability. This places a new significance on knowing *how* to learn, for the normal as well as the retarded.

Two ongoing projects were investigating relationships between pre- and post-natal development and subsequent learning problems. The University of Oregon Medical School (Portland) was looking particularly at the relationships between reading disability and early development and disorders, and the University of Minnesota (Minneapolis) was concerned with conditions of pregnancy, birth, and infancy in relation to exceptionality in school behavior and achievement.

Investigators at Colorado State University (Fort Collins) completed the last segment of a national survey to determine the prevalence of speech and hearing disorders in school children, and a model statistics-reporting system on impaired hearing was developed at Gallaudet (Washington, D.C.). Delgado College (New Orleans) was embarking on a demonstration of the feasibility of using existing vocational and technical schools and junior colleges to serve deaf students.

Several projects were devoted to improved communication for the blind. The University of Chicago's Argonne National Laboratory was working on a compact storage system of magnetic tape readible by touch, as Braille, to increase reading efficiency and comfort. American Printing House for the Blind (Louisville) was working on computer translation from print into Braille.

Besides the areas of the deaf and visually handicapped, relatively large investments were made in studies on the emotionally disturbed, the mentally retarded, and those with speech and hearing problems. It is interesting to note that, next to the Instructional Materials Centers, the largest category of support for education of the handicapped was for research and demonstrations related to multiple handicaps.

Age-grade levels

At the various educational levels, about 15 percent of total obligations went for preschool and early childhood studies, 30 percent for elementary and secondary education research and development, about 8 percent for post secondary studies, and 2 percent for adult and related occupational areas (See table 4). About 43 percent of the total investment went for activities where level was not designated and more than 1 percent toward improving articulation between levels.

Early Childhood Education—Research evidence has increasingly pointed to the importance of early learning experiences in shaping adult success or failure. To coordinate some of the major research and development efforts in this area, the National Laboratory on Early Childhood Education was established in February 1967. A major contract was negotiated with the University of Illinois, who in turn negotiated subcontracts for research centers at the University of Chicago, the University of Arizona, George Peabody College for Teachers, Cornell University, and Syracuse University. Another center has since been added at the University of Kansas, Lawrence. The total effort represents one of the most significant contributions to progress in the field of early childhood education.

The National Laboratory and its six university-based components study the education of children from birth through age 8. The total program is planned and managed through the National Coordination Center at the University of Illinois. The National Coordination Center also helps to initiate and sustain collaborative efforts among the component centers. The ERIC Clearinghouse on Early Childhood Education is a component of the National Laboratory and is also located at the University of Illinois.

The Arizona Center for Early Childhood Education (University of Arizona, Tucson) spent much of its fiscal year 1968 effort on studies of the young Mexican-American child and his family and the development and evaluation of a primary school curriculum for Mexican-American children. In 1968, investigators were carrying out a study on the demography and family style of Mexican-American families in the Southwest, with special attention to families with children in early education programs. The resulting information about Mexican-American culture will be useful in planning further educational improvements for these children.

Activities at the Chicago Early Education Research Center (University of Chicago) have concentrated on social and cultural influences on early development and learning, related research methodology and technology, programs and curriculums germane to improved learning, and programmatic intervention in school systems. As part of a more general investigation of teacher-pupil interaction in preschool classrooms, the Chicago Center has also been developing and testing instruments and coding schemes about how cognitive stimulation in children is responsive to the teacher's speech.

The Cornell Research Program in Early Childhood Education (Cornell University, Ithaca, N.Y.) has been emphasizing three areas: Curriculum development and learning processes in nursery school and kindergarten settings; home environment and parent intervention procedures; and cognitive and emotional development in infancy. One activity that has attracted wide interest is the center's story-reading experiment, in which teenage disadvantaged students read to 2- or 3-year-olds and encourage the children to repeat words, name objects in pictures, and talk about what is happening in the pictures. Preliminary data showed significant improvement on three measures of language abilities. Subsequent study is concerned with the effects the program has on the teenagers and on the families of participants.

The Demonstration and Research Center for Early Education (DARCEE) at George Peabody College for Teachers (Nashville, Tenn.) continued to study home and preschool intervention for disadvantaged children and their families; individual characteristics in cognitive style, concept development, visual attending behavior and other similar areas; and home environments.

One unique research study at the Peabody Center compared the effects of intervention with 5-year-olds, with or without parent involvement or home visitation. Evaluative data both on these children and on their younger siblings were analyzed.

DARCEE has also been developing a model for training low-income mothers to become home visitors for other mothers in similar circumstances. This work is built on home visitor training started at Peabody more than 5 years earlier, to help mothers provide intellectually stimulating environments for their children.

The Syracuse Center for Research and Development in Early Childhood Education (Syracuse University, Syracuse, N.Y.) has been developing a detailed description of behavioral capabilities or "learning sets" required for new and more complex learning tasks. The staff also worked on a series of tested programs for modifying behavior and enhancing general development relating to school performance.

The Kansas Center for Research in Early Childhood Education (University of Kansas, Lawrence) became operational toward the end of fiscal year 1968. It replaces an earlier center at New York University and was selected from among 27 applications submitted in response to a request for proposals. Investigators at the Kansas Center have been working on individual differences, learning, and infant development; sequenced task presentation for developing preacademic intellectual skills in children aged 15 months to 5 years; language learning and language competency; acquisition and performance of regulatory social responses; and the ecological reinforcers of the preschool environment.

In addition to the work coordinated through the National Laboratory on Early Childhood Education, some research and development in this general area has been carried out in individual projects and in studies by the centers and educational laboratories.

The most comprehensive of these other efforts is in the Research and Development Center for Educational Stimulation (University of Georgia, Athens). Based on research findings that 50 percent of adult intellectual capability is defined by age 4 and 80 percent by age 8, the Center takes a more longitudinal view than the National Laboratory on Early Childhood Education. Staff at the Center are developing sequential curricular materials for preprimary and early elementary levels in language arts, mathematics, science, art, music, and physical education. They are also conducting a longitudinal study of children who have used the materials in a classroom setting since age 3, to determine if they result in higher levels of achievement than would otherwise be obtained.

In fiscal year 1968, first drafts of reading and writing units to be used with 3-, 4-, and 5-year-olds were developed. Preliminary assessment indicated the units were effective with beginning 4- and 5-year-olds but needed revision for 3-year-olds. Five science curriculum units (Wind, the Rain Cycle, Temperature Variation and Effects, Plant Growth, Light and Shadows) have been developed. Lessons that were found to be effective for deprived children, age 5, seemed to be effective for privileged children a year or two younger. There has also been intensive development and field testing of social studies materials in rural, urban, and suburban areas.

Middle school years.—In fiscal year 1968, research and development related to education in the middle school years was weighted more toward instructional systems and practices than toward learning per se. However, two research and development centers were directly concerned with student learning, one more specifically with the management of learning, including computer-assisted and individually prescribed instruction reported later, and the other with the conditions and processes of learning concepts and cognitive skills. Some projects concerned themselves specifically with learning in the middle school years.

The Learning Research and Development Center at the University of Pittsburgh has been working primarily on development of prototype models of instructional procedures and materials, and on personnel training for using these procedures. Field research and basic learning studies also have been carried on to further the center's total effort. The Center's research has included exploration of the phenomenon of "attention" through analysis of eye movements, study of discrimination learning in children using computer programs, and a pilot investigation of differences between recognition and recall.

The Pittsburgh Center's staff have worked closely with Research for Better Schools, Inc., the Philadelphia-based laboratory, to test and refine their Computer-Assisted Instruction (CAI) and Individually Prescribed Instruction (IPI) developments in practical school settings. The Center also undertook a Primary Education Project (PEP), which is a joint effort of the Center, the Pittsburgh Public Schools, and General Learning Corporation. The aim of PEP is to develop an individualized curriculum, primarily for urban culturally deprived children, beginning at age 3 and running through the primary grades, using various kinds of reinforcements to encourage learning.

The Wisconsin Research and Development Center for Cognitive Learning (University of Wisconsin, Madison) has been investigating the way students learn concepts and cognitive skills. They also have prepared related materials and procedures to be tested and refined in school settings. Studies have involved the cognitive processes and situational variables which affect the way the learner analyzes the subject, secures relevant information, and processes that information in the learning of concepts in verbal argument, critical thinking, and problem-solving. Results of this research have been put to use in the design of materials and procedures for teaching arithmetic, reading, science, verbal argument, and English language and composition.

A basic research study at Stanford has been investigating the nature of aptitude and the interaction of treatment (instruction) variables. The goal is to find out how the individual "learns to learn" and how his learning rate varies from one learning experience to another. Completion of the study is scheduled for late 1969.

Sometimes pupil attitudes are powerful factors in their learning. In 1968, the University of Chicago completed a study of children's attitudes toward government and citizenship. For example, from more than 12,000 white, city children in grades 2 to 8, investigators found that the child first interprets policemen as highly benevolent, but that such idealization declines gradually over the grades.

Loyola University, Chicago, has been carrying on a longitudinal study of how children solve problems. This 5-year study involves group performance at different age levels, changes in individual problem-solving ability with aging, and responses to different modes of presentation.

At the University of Southern California (Los Angeles), an investigation was under way in 1968 to further distinguish among the intellectual abilities used in interpreting or transforming information. The objective is to find out how such abilities affect intellectual flexibility or functioning and to suggest some ways to enhance the individual's achievement potential.

Higher education.—Of the approximately $8 million for higher education research and development, about $2 million went toward undergraduate programs and students, $0.5 million toward junior colleges, and $5 million toward unspecified post-secondary education. The above figures do not include research training programs which benefit all levels of education and which are discussed in a later section of this report. All of the funds for improving higher education were from appropriations for Cooperative Research, except about $1.2 million for Media Research. Continuation support from Cooperative Research was provided to an ERIC Clearinghouse on Higher Education at George Washington University (Washington, D.C.) and one on Junior Colleges at the University of California, Los Angeles.

Primary areas of investigation included studies of achievement-motivation, curriculum and curriculum development projects, studies of the educationally disadvantaged, studies relating to student personnel services, projects on personality development and change, and studies relating to staffing and school administration.

The most comprehensive continuous effort in 1968 was being carried out by the Center for Research and Development in Higher Education (University of California, Berkeley), which has a broad mandate to improve the quality, efficiency, and availability of education beyond the high school. Its research falls in two major areas: (1) the impact of college on student development, and (2) the viability of existing institutional structures for the future of higher education. Studies on students, teachers, and administration, against a background of diverse institutional goals and structures, are designed to be mutually reinforcing.

The Center's research on students seeks to find out who goes to college, why students choose an institution, what happens as students leave their home environments, and why different institutions have different effects on different students.

Research on the viability of institutions is concentrated on the organizational components of higher education, including the authority structure, interaction of interest groups, the autonomy and accountability of colleges and universities, and the basic assumptions, values, and goals of higher education.

In fiscal year 1968, the Berkeley Center released preliminary findings from its study of statewide planning and its institutional impact on higher education in four States: California, Florida, Illinois, and New York. Studies found that planning was characterized by preoccupation with day-to-day operational matters related to growth pressures. Planning efforts of faculty and administrators generally lacked coordination and, where faculty did participate in planning, their contribution was mainly reactive rather than initiative or leading.

The staff at the Berkeley Center have endeavored to estimate the impact of their research in terms of visible institutional changes which can be traced to Center activities. They use feedback from these changes in refining Center plans. An extensive program dealing with problems of the university in an urban society is scheduled for early 1969.

Late in fiscal year 1968, the Academy for Educational Development, Inc., Washington, D.C., received a grant to establish a national planning congress for higher education. The purpose of the congress is to develop policies and strategies to guide the growth of higher education in the years immediately ahead. Staff were requested to carry out appropriate background studies and analyses to help develop goals for national and regional planning and strategies for reaching those goals. Steps will be taken to evaluate costs and make recommendations about alternatives. When the Academy was funded, there was almost immediate evidence that it would be a sounding board for college and university presidents concerned about the future of higher education and seeking a vehicle for positive action that would reduce the need to fight local pressure battles individually. A related small-project study was underway at the University of Massachusetts (Amherst) to find out the intellectual and personality differences of student activists and non-activists and whether these differences are a function of their activism or their ideology.

The research activities undertaken by the nine institutions affiliated through the College Center of the Finger Lakes (Corning, N.Y.) is typical of the way consortiums use research development grants to design their own self-improvement strategies. Oriented toward liberal arts, these institutions all together have about 12,000 students and about 800 faculty members. Their tradition has favored educational innovation and experimentation, but they wanted objective, rather than subjective, evidence for program development. Consortium activities provided this opportunity on a cooperative basis. For example, staff members in one of the participating colleges developed a chemistry curriculum which was subsequently applied and tested by other member colleges. By the time the research development grant rounds out the third, and final, year of support, the institutions should have developed a firm consortium framework with momentum for continuous coordination of self-improvement efforts.

The Regional Educational Laboratory for the Carolinas and Virginia (RELCV), Durham, N.C., helped representatives of 20 colleges and universities in its region analyze their institutions and formulate effective solutions to specific problems. Activities included assistance with college staffing and investigation of the contributions humanists make in college and university decisionmaking. By fiscal year 1968, cooperative working relations had been established with State education agencies in the region, the Education Testing Service, and Duke University's Center for Higher Education, and 38 studies were carried out.

Support was provided to the Institute for Services to Education (Washington, D.C.) for a 2-year program of curriculum development to help selected predominantly Negro colleges find ways to overcome the deficiencies of students from intellectually undemanding environments. Curriculum areas to be developed included (1) ideas and their expression, (2) quantitative and analytical thinking, (3) social institutions, their nature, and change, and (4) biological and physical sciences.

A small project at Notre Dame College (Belmont, Calif.) was concerned with computer centers in higher education. It investigated the source of their financial support, what the usage patterns are, who makes computer decisions, and what changes are anticipated for future computer center decisionmakers.

In another small project, investigators from the Minnesota State Department of Education studied the feasibility of coordinating educational information systems and associated data processing throughout the State. Results should be useful to other States about to undertake similar studies.

Support also was provided to the ERIC Clearinghouse for Counseling and Personnel Services (University of Michigan, Ann Arbor) to identify, describe, and evaluate an optimal program of personnel services for college students from disadvantaged backgrounds. The staff was asked to analyze current practices, design and try out a model program, and suggest what functions would be appropriate in various situations.

Also in fiscal year 1968, the University of Washington (Seattle) was completing the last stages of a demographic and ecological analysis of college student migration, and the Institute of Human Learning at Florida State University (Tallahassee) was in the second and last year of investigating computer-assisted instruction in college physics.

Media research support was provided for a cost study of educational media systems and their equipment components, carried out by General Learning Corporation (Washington, D.C.) and an analysis and evaluation of present and future multimedia needs in higher education, carried out by the American Institute for Research in Behavioral Sciences, Silver Spring, Md.

Adult education.—Activities identified as adult education, or as occupational without a specified level, received about 2 percent of the fiscal year 1968 support, either from Cooperative Research or from Section 4(c) of the Vocational Education Act, whichever was appropriate. The report of a project at Columbia University provided evidence to help structure learning materials for adults and one from the University of North Dakota disclosed that adult memory is not as much related to age as it is to the degree of previous learning. Other reports examined factors that prompt middle-aged women to seek further education (University of Oregon, Eugene) and analyzed differential attitudes of adults who complete courses and those who drop out (Boston University).

Development activities produced a series of readers and teaching manuals geared to vocational interests of functionally illiterate adults (University of Missouri); a set of instructional techniques for using a master teacher via electronic communication in place of less skilled local teachers (B'nai B'rith Commission on Adult Jewish Education, Washington, D.C.); methods for upgrading the training of cooperative extension agents (Ohio State University); and an exploration of simulation techniques (gaming) in retirement education (National Council on the Aging, Inc., New York City).

Three adult education studies were among projects receiving continuation support in fiscal year 1968. Researchers at Syracuse University were in the second year of a study exploring in depth the differences in learning abilities that are associated with individuals classified as young, middle-aged, and older adults. Teachers College, Columbia University, finished an investigation of factors that affect participation by young noncollege bound adults in education programs. At Washington University (St. Louis, Mo.), an experiment in adult education instructional management determined the effects of "elective class participation," where resource materials and facilities are provided but their use is not specifically required.

An ERIC Clearinghouse on Adult Education, located at Syracuse University, received Cooperative Research support.

Instructional systems and practices

Activities which focused primarily upon improvement of instructional systems and practices received about 33 percent of the 1968 investment in educational research and development. The largest segment of this went for curriculum content development, and the remainder for a variety of instruction-related activities. It should be pointed out, however, that specific curriculum content areas can be identified in many of the projects focused primarily upon student learning or upon specialized practices with new media. All together, specific content areas were identifiable in activities receiving about half of the total support for educational research and development.

The examples in this section are grouped in three areas: those concerned primarily with specialized instructional systems; those with basic, academic, or occupational content elements; and those related to preparation or upgrading of education professionals.

Specialized instructional systems

Two sets of conditions are responsible for the growth of specialized learning systems: increasing recognition of individual differences in student abilities and interests, and development of media capabilities for serving student learning. The complexities of dealing with individualized learning have been an important factor in the growth and utilization of media as educational tools. In 1968, almost $3 million was invested in computer-related teaching-learning activities, $2 million in television-related learning, and substantial amounts in various individualized learning systems.

Self-directed and individually prescribed learning.—Classroom practices are increasingly being adapted to break the age-grade lockstep and permit each student to advance at the rate and depth of which he is capable. Typical extension or refinement of these flexible-progression practices often leads to the use of various media to supplement and complement the traditional teacher and textbook kind of teaching and learning.

Self-directed student learning has been the major focus of the Mid-Continent Regional Educational Laboratory (McREL), Kansas City, Missouri. The staff have been striving to identify patterns of student behavior associated with self-directed learning and to define what teachers can do to elicit such behavior from students. Classrooms using the self-directed inquiry of the Biological Science Curriculum Study (BSCS) are being used as observation sites to identify associated teacher practices and test McREL's measurement instruments.

Individually Prescribed Instruction (IPI) is a system which enables each student to progress through an organized program of studies tailored to his learning needs and characteristics. Much of the initial IPI development was done by the Pittsburgh Learning Research and Development Center. Research for Better Schools, Inc. (RBS), the Phi adelphia-based laboratory, has been assisting with field testing, monitoring and refining the system.

IPI was initially used in the Oakleaf Elementary School in the Pittsburgh suburbs, then expanded to a five-school network. Twenty-one additional schools adopted IPI in the fall of 1967 and 65 more in September 1968. In its cooperation with the

Pittsburgh Center, RBS has been collecting pupil data from participating schools and taking increasing responsibility for training teachers and administrators in the use of IPI. Staff also help develop and screen subject materials for the IPI program. RBS has also been developing and field testing programed curriculums for teachers.

Both the Regional Educational Laboratory for the Carolinas and Virginia (RELCV), Durham, N.C., and the Central Atlantic Regional Educational Laboratory (CAREL), Washington, D.C., have been instrumental in introducing IPI into schools in their regions.

The Pittsburgh Center's IPI activities provide a good example of interrelationships between research (activities to find out what *is*) and development (activities to reach identified goals). Staff continued to review and revise curriculum objectives and material in mathematics, reading, and science. Work on the mathematics program added materials for the middle years. Reading workbooks and supplementary materials were completed for the first year's program and various strategies for revising the materials were investigated. The entire science curriculum, involving scripts, lesson booklets, and kits of materials for over 100 student lessons, was being restructured for computer management during the coming school year.

In a related program, the Mid-Continent Regional Educational Laboratory (McREL, Kansas City, Mo.) is identifying special factors and developing strategies to foster self-directed learning among the disadvantaged. This effort is receiving additional support from Danforth Foundation, the American Association of Colleges for Teacher Education, and 18 regional colleges. Emphasis is on preservice clinical teaching experiences for students interested in working in inner-city schools. Some attention has also been given to the use of comprehensive student data in fostering self-directed learning, and videotapes have been used to record classroom teaching situations for subsequent analysis.

A different kind of instructional "system" has been receiving attention at the Central Midwestern Regional Educational Laboratory (CEMREL), St. Ann, Mo. The laboratory has been developing and testing a "social exchange system" for use particularly with students who have learning disabilities. The system is a technique for encouraging learning by rewarding children for desirable behavior. Sessions conducted with autistic-schizophrenic, hyperactive, and other young students with learning disabilities brought about significantly improved behavior. Summer training sessions in theory and techniques were provided for parents and teachers. At the junior high school level, a variety of techniques were tried to improve student attitude, self-concepts, and academic performance, particularly for students with average or above average intelligence but consistently poor performance records.

Computers as instructional tools.—Work supported through the Bureau of Research has been going forward to develop machine capabilities for Computer Managed Instruction (CMI) and for direct Computer-Assisted Instruction (CAI).

The former uses machines to keep track of student progress, thus enabling the teacher to diagnose student needs and give more time to direct assistance where appropriate. The latter carries some of the instructional load by assisting students with drills and other kinds of private learning so that the teacher has time for group discussion and other activities outside of the computer's capabilities. Some progress also has been made in developing computer programs for guidance and other services.

A computer-managed instruction (CMI) system frees the teacher from routine tasks by assisting in monitoring and recording the details of each child's performance and by providing teachers with diagnostic information to help them make decisions about instruction. In the 1968 phase of CMI at Southwest Regional Laboratory, Inglewood, Calif., student work in reading and mathematics in four first-grade classrooms was computer-connected by teletype with facilities at System Development Corporation (Santa Monica). Teachers received printouts of individual and group scores, indicating where additional instruction was needed.

As IPI reaches more students, participating schools are moving toward computer management of student records. To facilitate this kind of recordkeeping, the Pittsburgh Research and Development Center gathered complete instructional history files on the 200 students attending Oakleaf School. These data will be useful for research and evaluation. Already they are the basis for studies of procedures to measure and predict rate of learning in IPI classrooms and to determine relationships between student characteristics and time required for unit mastery. Comparisons in performance on the Iowa Tests of Basic Skills showed that IPI pupils generally mastered content better than non-IPI pupils.

The Pittsburgh Center also carried out a pilot program of behavioral analysis in teacher training. Videotaped sessions will be used for diagnostic pretraining for subsequent groups of teachers.

Computer-assisted instruction (CAI) seems to have great potential, but it is costly to develop. The Central Midwestern Regional Educational Laboratory (CEMREL), St. Ann, Mo., has been cooperating in the evaluation of the computer-assisted instruction (CAI) developed at Stanford. A group of schools in eastern Kentucky and Appalachia, and Morehead State University (Ky.) have been field testing CAI as a means of improving arithmetic skills of children in grades 1 to 6 in small rural schools. Additional populations include teachers, administrators, and parents of the children, and adults enrolled in basic literacy classes. The goal is not only to improve mathematics instruction but also to evaluate the social impact of the computer as a mode of instruction.

Projects which make use of the computer for vocational guidance were supported at Harvard and the American Institute for Research in Behavioral Sciences (Pittsburgh). The Harvard project, which will terminate in June 1969, is seeking to produce a prototype information system for vocational decisionmaking from the upper elementary grades through high school. The student conducts a dialog with the computer about education, training, and work, and the teacher or counselor helps interpret and evaluate results.

The study at the American Institute for Research, which started late in fiscal year 1968, incorporates career progression information from Project Talent data banks and integrates student abilities, aptitudes, and interests with guidance learning units for each vocation. Materials initially are being developed and tested for ninth grade.

In 1968, a policy study based on a traveling seminar of 12 senior scientists and educators, funded through George Washington University, reported the critical issues related to development of computer usage and future possibilities of computers as tools in education; their effects on society (e.g., privacy, mental health, manpower training) and on individual logic and creativity. These elements were considered within the context of broad educational goals, systems analysis potentials, and areas for further research and development.

Instructional television and other media.—Television instruction and computer-assisted instruction complement each other because they are used to facilitate different kinds of learning.

In recognition of television's educational potential for preschool children, a major project was funded with National Educational Television Corp. (New York) near the close of the fiscal year. Cooperative Research and Title VII NDEA (Media Research) support was made available to test the effectiveness of the television medium in promoting the intellectual and cultural growth of young children, particularly 3- and 4-year-old disadvantaged children.

The project's advisory board represents a broad range of experts, such as film creators, authors of children's books, advertising media specialists, teachers, and psychologists. A series of 1-hour television programs will be produced to capitalize on the medium's potential by teaching numbers, classic stories, the alphabet, language, and the art of reasoning.

Sample materials with an emphasis on cognitive skills are to be tested on preschoolers for attractiveness and instructional merit. The program is expected to reduce educational deprivation of ghetto children.

The Office of Economic Opportunity and National Institute of Child Health and Human Development are assisting in support of the project.

Other uses of television for systematic classroom instruction are being refined. For example, the "Patterns in Arithmetic" program developed at the Wisconsin Learning Research and Development Center is now being widely distributed by the National Center for School and College Television, Bloomington, Ind. The program had previously been field tested with 100,000 children in four States. This television arithmetic program involves 32 videotapes in grade 1, 48 in grade 2, and 64 in each of grades 3, 4, and 5, plus teacher handbooks and student exercises for each grade.

Staff at the Regional Educational Laboratory for the Carolinas and Virginia have also been investigating television as a means of instruction. They want to determine the potential of adapting the Samoan educational television type of activities to teach English as a second language to area children who speak nonstandard dialects.

At the higher education level, the Nebraska Educational Television Council for Higher Education, Inc., at the University of Nebraska carried out a project which has potential for other States seeking to share instructional resources via television. All 24 colleges and universities in Nebraska cooperated in developing a statewide educational television network and orienting faculty for efficient utilization of the available television resources.

Schools and school systems have used small project grants to research innovative uses of media. For example, Gardner (Mass.) Public Schools used such a grant to develop special techniques for using television in adult basic education, and the Richmond Unified School District (Richmond, Calif.) received a grant to test the value of aviation as a means of motivating disadvantaged secondary school pupils.

From a media study of a more general nature, San Jose State College reported on the evaluation phase of a Title VII NDEA demonstration of audiovisual media and their applications for educational change. Included in the evaluation were 25 kits of materials produced in an earlier segment of the project.

An ERIC clearinghouse on Educational Media and Technology is operated by the Institute for Communication Research, Stanford University.

Curriculum content improvement

Most of the studies to improve curriculum content are also concerned with techniques for teaching and learning that content. An analysis of support for studies in which subject-matter content could readily be identified shows that about half of the support went for activities involving basic knowledge and skills. The other half was about equally divided among studies involving academic knowledge or skills, various occupationally and specialized fields, and those on curriculums of educational professionals. (See table 3.)

Basic and academic knowledge and skills.—Out of the activities where basic and academic subject fields could be identified, about half of the support went for studies concerned with more than one major field. This is in keeping with the growing trend toward integration of subjects, particularly at the elementary school level. Language and reading, and related communication arts together formed the next largest field. Language arts, including reading, composition, and related communication skills, were the focus of activities costing almost $10 million in fiscal year 1968 funds. In many instances, oral or written communication was simply the subject area in which certain kinds of learning skills or instructional systems were investigated or developed, but some activities were concerned more directly with the content. A substantial amount of support in this area went for bilingual education and English as a second language.

The communication skills program at the Southwest Regional Laboratory (SWRL), Inglewood, Calif., is designed to develop instructional materials and methods for children in grades K–4. Kindergarten materials stress reading and oral communication and interpretation. In fiscal year 1968, SWRL tested first-year materials and techniques in classrooms throughout the region, adapted the materials for populations who do not speak a standard dialect, for older beginning readers, and for remedial situations, and worked on the second- and third-year communication skills program.

The Southwestern Cooperative Educational Laboratory (SWCEL), Albuquerque, N. Mex., has been developing materials and methods for teaching language arts in the primary grades to children of culturally diverse groups, particularly Spanish-Americans and Navajo and Pueblo Indians. Resources have been invested in two major areas: curriculum development in oral language skills, and relationships between home, community, and school environment which affect the development of language arts skills.

Initially, the laboratory examined existing oral language materials and methods to determine their efficiency and cultural relevance for teaching English as a second language. During the 1967–68 school year, SWCEL tested and revised 147 lessons developed by the Center for Applied Linguistics at the University of California at Los Angeles to teach oral English to Spanish-American and Indian students and developed and tested a program to train teachers to use such materials.

In fiscal year 1968, the University of Georgia (Athens) completed the last segment of a 5-year curriculum project to develop and field test a sequential academic program in written composition for children from kindergarten through grade 6. The resulting materials are designed to enrich the child's perceptions and stimulate his conceptual processes so that he will have a wealth of ideas and be able to express them clearly. The sequential program emphasizes development of a range of required skills from informal letterwriting to formal composition.

A systematic study of reading as a process is being undertaken to help solve some of the problems long associated with learning to read. The initial step was a planning effort carried out under a contract to Phi Delta Kappa (Bloomington, Ind.) which resulted in recommendation of a convergence technique to focus on the precise investigations needed for the undertaking. The goal is to describe the reading process as a series of specific perceptual, behavioral, physiological events. Knowledge of this process could provide a dependable basis for developing a basic understanding of the influence of sociological, environmental, and situational factors in reading.

In the meantime, other related efforts to improve reading instruction have continued. For example, in fiscal year 1968, the Wisconsin Learning Research and Development Center's prototype individualized reading curriculum was being tried out in five Madison schools. The total system will include sequenced instructional materials, a taxonomy of concepts and cognitive skills, and related assessment instruments. The primary aim is to develop a means for individualizing reading instruction through constant diagnosis and prescription of materials and procedures. Findings from this and other reading research will be utilized in the total convergence technique effort to define the reading process.

An ERIC clearinghouse on reading is located at Indiana University and one on the teaching of English at the National Council of Teachers of English, Champaign, Ill.

Science and mathematics research and development activities were concerned with new approaches in learning content and hence they complement and supplement the National Science Foundation efforts in these areas.

In fiscal year 1968, Florida State University (Tallahassee) completed the second year of work on a coordinated science curriculum for the junior high school. The objectives are to develop an understanding of science principles, scientists, and the scientific enterprise, and to increase student facility in using scientific processes. Seventh- and eighth-grade materials are on physical sciences, ninth-grade materials on earth and biological sciences.

The Wisconsin Research and Development Center's science instruction system for grades K–6 uses mechanical models to teach theoretical concepts. Preliminary field tests indicate that such models can be effective with children from about grade 3 upward and that learning to use the models is not significantly affected by IQ and past achievement in science and mathematics.

At the higher education level, a small project based at the Southern State College, Magnolia, Ark., investigated the teaching practices and materials used in introductory college chemistry, and reported on the nature of the current revolution in the teaching of this course.

An ERIC Clearinghouse on science education is located at Ohio State University, Columbus.

Ways to implement the mathematics approach developed earlier by researchers at Syracuse University and Webster College were described in final reports of demonstration activities received during the year. This revitalized mathematics development has been called the Madison Project, after the Syracuse elementary school where the effort to reform mathematics instruction was started about a decade ago. The system introduces young children to abstract mathematics by involving them in problem-solving situations. It recently has been the subject of workshops throughout the country as school systems have sought to train educational leaders who in turn help colleagues upgrade their techniques for making mathematics exciting and enjoyable. The materials developed in the Madison Project have been found effective with gifted children as well as with the culturally deprived.

In fiscal year 1968, the Central Midwestern Regional Educational Laboratory (CEMREL), St. Ann, Mo., was working on a Comprehensive School Mathematics Program (CSMP) for grades K–12, to individualize mathematics study according to student abilities and interest. The curriculum will be composed of a series of activity packages which make use of a variety of media, including films, tapes, and computers. During the first year, with joint sponsorship from Southern Illinois University, content was outlined for grades 3 to 5, individualized packages for third grade were tried out, six texts for able students were produced and field tested, teacher training activities were outlined, and prototype pre- and post-tests were developed and evaluated for the first activity packages.

A unified mathematics program for grades 7 to 12 was being explored through a grant to Teachers College, Columbia University. The long-range project aims to reconstruct (not merely update) high school mathematics so that there is not the traditional separation into algebra, geometry, trigonometry, and other areas. A program which will take capable students well into current collegiate mathematics has been outlined, and texts are being written, tried out, and revised. In fiscal year 1968, more than 3,000 students in grades 7, 8, and 9 in 36 school districts were using the new unified mathematics.

There was a substantial 1968 investment in activities to improve general problem-solving skills. For example, a program at the Southwest Regional Laboratory (SWRL), Inglewood, Calif., was developing a curriculum to teach kindergarten children basic skills and children in grades 1 to 4 the more complex processes of solving problems in mathematics and biological and physical sciences. The kindergarten program, geared to the culturally disadvantaged, involves concepts such as color, size, shape, and numbers. The materials were to be tried out in a large number of classrooms beginning in September 1968.

Social studies and related areas accounted for about $2 million of the 1968 research and development investment.

One of the more comprehensive social studies efforts was being carried out by the Central Midwestern Regional Educational Laboratory (CEMREL), St. Ann, Mo., with the cooperation of the metropolitan St. Louis Social Studies Center, local school districts, and a grant from title III of the Elementary and Secondary Education Act. In developing an implementation model for diffusion of exemplary new social studies curriculums, CEMREL's initial strategy involved 24 schools organized into four clusters. One school in each cluster served as the center for pilot testing, after which the curriculum was diffused to the other five schools.

The Johns Hopkins research and development center has been extensively involved in developing a repertoire of simulation games for use in junior and senior high school social studies. As a teaching device, the games change the social structure of the classroom, especially the student-teacher relationship, giving the student new kinds of decisionmaking experience. During fiscal year 1968, the Johns Hopkins staff conducted numerous workshops, demonstrations, and lectures, in response to requests from groups starting gaming programs or interested in designing or evaluating games.

International understanding was the focus of a number of social studies activities in fiscal year 1968. For example, the University of California (Berkeley) was in the fourth and last year of a project to develop teaching guides and materials about Asian countries for use in grades 1 to 12. The purpose of the project was to improve instruction on Asian countries as an integral part of the social studies curriculum. Project staff and regular teachers worked together to prepare annotated bibliographies of available instructional materials and teaching guides and other materials on selected topics.

At the University of Texas (Austin), a curriculum development project on Latin America was in its second year. The major objectives were to identify key ideas which should be taught in elementary and secondary school social studies, suggest a general sequence, and prepare teaching guides and annotated bibliographies.

A Princeton University project brought together prominent sociologists to discuss ways in which sociology and education can be mutually beneficial. Participants identified profitable areas for research and development activities and suggested how these activities might contribute to improved educational opportunities.

Support was provided to the Foreign Policy Association (New York City) for a systematic evaluation of objectives, needs, and priorities in the whole area of international education in American elementary and secondary schools. Recommendations were to be presented following a critical analysis of all aspects of curriculum bearing upon world understanding.

Arts and humanities priority areas during fiscal year 1968 included perceptual learning, the arts in general education and in the education of the disadvantaged, and effects of educational technology and computer-assisted instruction in teaching the arts and humanities.

In the area of perceptual learning, a comprehensive basic study at the University of California (Berkeley) began exploring development of creative aesthetic expression and responsiveness to aesthetic qualities of visual experience. One of the objectives is to find out how an increase in a student's aesthetic judgment affects his capacity to create aesthetically.

A community arts study program at the University of Oregon (Eugene) is concerned with perceptual learning to encourage community awareness of environmental design problems. Information derived from studies such as this should help individuals make qualified independent decisions in relation to unique cultural, structural, and geographic conditions of the community.

At Florida Atlantic Ocean Sciences Institute (Boca Raton), the educational potential of nonverbal communication is being investigated to determine how the arts of the theater, the dance, music, and the plastic arts communicate emotion by the application of modern techniques derived from the physical and life sciences.

Laboratory theater projects have been acclaimed as effective demonstrations of the relevance of the arts to general education. In fiscal year 1968, Los Angeles became the site of the third such program, others having previously become operational in New Orleans and Providence (R.I.). By developing new working relationships between the public schools and resident professional theater companies, the laboratory theater program demonstrates how the living arts of the theater can be made an integral part of high school learning experience by developing increased perceptual skills, enhancing reading and writing experiences, and generating other interdisciplinary understandings. Curriculum packages, study guides, audiovisual materials, seminars, demonstrations, lectures, and in-theater workshops accompany the live performances. In fiscal year 1968, continuation support was provided to all three laboratory theater projects.

Since 1966, the Central Midwestern Regional Educational Laboratory (St. Ann, Mo.) has been studying the impact of educational laboratory theaters. In 1968, support was provided for further systematic research of the efficiency of these programs and the laboratory took steps toward designing a comprehensive plan for a K to 12 curriculum in aesthetic education.

Beginning with the OE-sponsored Gaithersburg Conference in November of 1966 on "The Role of the Arts in Meeting the Social and Educational Needs of the Disadvantaged," the arts and humanities program has placed increasing emphasis on stimulation of worthwhile projects in this area. In fiscal year 1968, Brooks Foundation (Santa Barbara) undertook a national survey of performing arts programs for the disadvantaged, and the Institute of Behavioral Research (Silver Spring, Md.) began an assessment of the 1967 Friends-Morgan summer project, an 8-week program which used the arts to teach specific academic skills to more than a hundred poor children from the Morgan Elementary School in the District of Columbia. The Friends-Morgan project was initially made possible largely through liaison efforts of the Office of Education arts and humanities staff in arranging for operational funding from private and public sources.

Using funds committed the previous year, Stanford University completed a comparison of the developmental drawing characteristics of culturally advantaged and disadvantaged children and reported finding a significant positive correlation between drawing scores and reading vocabulary.

In response to widespread appeals from inner-city schools for more emphasis on Afro-American arts, 1968 support was provided to Howard University to develop a 1-year course in African music for general undergraduate students.

The arts and humanities program has been working cooperatively with the Smithsonian Institution and the American Association of Museums in planning and executing a basic survey of museums and related institutions to ascertain the nature and extent of museum program activities relative to education. The study has been of crucial importance in enabling the Federal Council on the Arts and the Humanities to report on the condition and urgent needs of America's museums. As an outgrowth of its involvement, the Smithsonian created the Anacostia Neighborhood Museum, which has attracted national attention as a learning facility in a ghetto area. A different kind of interest in museums was followed up by the University of Wisconsin (Madison) which received media research support in fiscal year 1968 for continued study of the application of programed learning procedures in a museum environment.

Training of researchers in arts and humanities received specific attention in several programs. For example, research training in art education was a specific component of a comprehensive program at the University of Georgia (Athens), and a program in music education research was carried out at the University of Michigan (Ann Arbor). The

National Art Education Association (Washington, D.C.) received support for a series of 3-day intensive research training sessions preceding regional conferences.

Small project support was used for a variety of activities. Among these were a critique of research studies in music education (University of Illinois, Urbana), a description of community theaters and an international conference on theater education (American Educational Theatre Association, Washington, D.C.), a collection of ethnic dances for use in the schools (University of California, Los Angeles), and studies on recovery of titles and abstracts of research in art (University of Rochester).

The Central Atlantic Regional Educational Laboratory (CAREL), Washington, D.C., devoted part of its effort to the diffusion of arts and humanities programs in the schools. Work was in progress on developing curriculum materials in art, music, theater, dance, and literature for students from 3 to 9 years of age. Early in fiscal year 1968, CAREL worked with a group of teachers, artists, and art educators to specify a sequence of goals for art instruction and the teaching exercises to reach those goals. During the regular school year, these were refined through classroom use and some additional work also was done on programs in music, theater, dance, and literature.

Foreign languages research and development support came almost exclusively from appropriations for Title VI of the National Defense Education Act. In fiscal year 1968, $2.9 million was obligated for 46 new and continuation projects, for operation of ERIC clearinghouse on linguistics and the teaching of foreign languages, and to cover part of the cost of language and area centers authorized by the NDEA. The systematic research and development supported by this program has resulted in improved techniques and instructional materials in about 130 of the less commonly taught languages. This program and foreign currency financed research out of Public Law 480 funds were lodged in the Institute of International Studies when it was established in March 1968.

Occupationally specialized learning.—Most of the occupation-oriented research and development activities were supported out of appropriations from Public Law 88–210, sec. 4(c), but Cooperative Research was used in some instances where vocational and comprehensive education were interrelated. Priority areas for fiscal year 1968 included work toward development of comprehensive educational systems for the 1970's to broaden vocational options of all students; studies concerned with emerging new careers and related program development; improvement of vocational guidance; activities to improve continuing education for adults; further refinement of State Research Coordinating Unit functions; and training institutes to upgrade vocational education personnel and develop staff competencies for new program demands.

The work toward a comprehensive education system for the 1970's took a completely different approach to secondary education, looking first at performance objectives and then at content and teaching-learning techniques to reach those objectives.

As a start toward redefining educational goals, grants were made for the specification of performance objectives in citizenship (Columbia University) and in business education (Ohio State University). A pilot program to study the problems of classifying and integrating objectives was funded with Rutgers University. Discussions with the various major curriculum development groups were held to determine their interest and capability in further work on performance objectives.

Alternative instructional models which will serve as prototypes for the major curriculum building activities were being developed at the U.S. Naval Academy, by Southwest Educational Research Laboratory in cooperation with Los Angeles Public Schools, and by the Pittsburgh Learning Center in cooperation with the Oak Leaf School District and New York Institute of Technology. At the local level, six schools were using Title III ESEA funds for related curriculum development. An analysis of teacher roles was being undertaken by Nova University (Fort Lauderdale, Fla.) to determine what new skills teachers may be expected to need in the 1970's. Results of other work already in progress, like Stanford University's 3-year effort to refine flexible scheduling and Penn. State's experimentation with computer-assisted instruction in technical education will be incorporated in the total endeavor as appropriate.

Pilot efforts are also being undertaken by the Western Association of Schools and Colleges to find improved ways to evaluate and certify student programs based on performance measures, and by the

Atlanta Public School System to transform a 2-semester system to a 12-month, 4-quarter system, permitting entry and exit of students at any time.

Continuation study was provided for several longitudinal studies which have implications for career development. The American Institute for Research in Behavioral Sciences (Pittsburgh) continued its Project Talent followup work to provide more specific planning information for high school student programs. Investigators at Regis College (Weston, Mass.) continued a study in search of sex differences in career development patterns. Educational Testing Service (Princeton, N.J.) concluded a study on relationships between intellectual growth and vocational development by both Negro and white students. A University of Iowa (Iowa City) study, which initially sought to isolate factors that influence vocational attitudes during school years, developed and tested instruments to measure vocational maturity.

Near the close of fiscal year 1968, the Great Cities Research Council (Chicago) received a grant to conduct a pilot program for Veterans in Public Service (VIPS). The project will demonstrate practical career development programs for veterans to work in inner-city schools and communities. It will capitalize on the experiences and talents of returning veterans, provide models for ghetto youth, encourage differentiated staffing in urban schools, and expand the Teacher Corps into the paraprofessional fields. The total program will include community work, special training, seminars, classroom apprenticeships, and college or university attendance, to round out a practical program for work in urban schools.

Career oriented research in 1968 was concerned primarily with human service careers and emerging technical occupations. Among the former are careers and curriculums for administration of justice and other police work (New Careers Development Organization, Oakland, Calif.); employment and education of subprofessionals in public and private social service agencies (YMCA of Metropolitan Chicago); employment roles and functions in the instructional media field (NEA Department of Audiovisual Instruction, Washington, D.C.); recreation service careers for the ill, disabled, and aged (New York University); and new careers in major municipal agencies (Institute for Local Self-Government, Berkeley, Calif.). Near the end of fiscal year 1968, the Industrial Relations Institute at the University of Oregon (Eugene) received a grant to make a cost benefit analysis of nonprofessionals employed as classroom aides.

Other emerging subprofessional occupations which have been receiving attention include electromechanical equipment technician, electro-optical technician, and nuclear medical technicians (Technical Education Research Center, Cambridge, Mass.) and biomedical equipment technician (Technical Education Research Center, Waco, Tex.). A national conference on subprofessional careers, held in mid-1967, provided the impetus for an institute on new careers in March 1968, in which 200 leaders from human service fields explored ways to structure models of new career opportunities.

In accordance with policy for the long-range operation of the Research Coordinating Unit (RCU) program, established in 46 States, at least 50 percent of the fiscal year 1968 funding was from sources other than from Public Law 88–210, sec. 4(c). The RCU's provide a vital link between the vocational-technical ERIC clearinghouse located at Ohio State University, Columbus, the vocational educational research and development centers located at North Carolina State University, Raleigh, and Ohio State University, Columbus, and various other vocational education research and training activities.

In fiscal year 1968, 20 summer institutes offered training programs to upgrade present personnel or develop an adequate staff for new programs of vocational and technical education.

Program improvement for education professionals.—Approximately $8 million of 1968 research and development funds was invested in programs for education professionals. Much of this went to improve instructional methods and teacher educational curriculums.

Major teacher education improvement efforts were carried on by two research and development centers and a group of related studies known collectively as the Teacher Education Development Program. In addition, strategies for encouraging improvement among practicing professionals were receiving special attention in some of the educational laboratories; teacher training components were included in a number of comprehensive curriculum improvement projects in subject areas; and a variety of teacher education activities were being carried out in separate projects.

The work of the Stanford Center for Research and Development in Teaching and that of the University of Texas (Austin) Research and Development Center in Teacher Education complement and supplement each other. Although both concerned themselves with the behavior and characteristics of teachers, one focuses on teaching and the other on teacher education.

In fiscal year 1968, the major effort of the Stanford Center for Research and Development in Teaching was on developing ways to help the teacher understand how student learning is affected by specific teaching techniques, attitudes, and school environments. A microteaching clinic served both as a medium for instruction and a vehicle for research. In microteaching, the teacher has an opportunity to observe feedback showing results of technical skills in discrete teaching-learning situations.

Researchers also were investigating the effect of the teacher's attitude on student learning. They sought to describe patterns of specific teaching behaviors which are relatively independent of the nature of the subject-matter and characteristics of students, and to find ways to train teachers in these specific teaching behaviors. A series of experiments was conducted to study the effects on teacher training of (1) conditions of practice teaching, (2) feedback arrangements, and (3) method of demonstration. A film on technical teaching skills was produced to explain concepts, and related training paradigms were developed and tested.

As part of Stanford's project to improve training of foreign language teachers, a training syllabus for teachers of Spanish was completed. Videotapes to train social studies teachers were also developed and evaluated. Investigations were under way to determine how computer-assisted instruction (CAI) changes children's general classroom behavior and what characteristics of children predict achievement gains in CAI as distinct from gains in the usual kind of teacher-led group.

At the close of fiscal year 1968, the Stanford Center was redefining its goals and shifting its focus from the variables which affect teaching and learning to the development of programs and practices which stimulate self-directed or heuristic teaching styles and capitalize on flexible school environments and school-community cooperation.

The Austin Research and Development Center.in Teacher Education has been investigating relationships between teacher education experiences and subsequent successful teaching and learning. The goal is to develop the kind of program which will help the potential teacher maximize his ability to evoke learning from students.

The Center's philosophy is based on earlier research findings that self-knowledge makes the teacher alert to his own actions and their consequences and that this openness to experience helps him find better ways to help students learn. The center maintains that teacher educators should instruct teachers in the same way that those teachers will eventually instruct their pupils, and that each teacher in training should have experiences appropriate for his own maximum development. This research is the basis for developing a diversified array of small instructional segments or modules which can be combined according to individual student needs and will ultimately form a complete system of teacher education.

At the Austin Center, a theory about the interacting effects of teacher and child behavior led to the development of a system for analyzing sequences of classroom events collected on videotapes. Information about the observed behavioral reactions to teaching strategies is then fed into a computer and analyzed to determine how children shape teacher behavior as they reinforce a given tactic or respond negatively to it.

During fiscal year 1968, the Austin Center also did some work on developing and testing elements of experimental college-level programs for instructing prospective teachers.

Most of the educational laboratories gave some attention to teacher training in connection with their overall programs, but two of the laboratories placed major emphasis upon the improvement of teaching efficiency.

In fiscal year 1968, the Upper Midwest Regional Educational Laboratory (UMREL), Minneapolis, was taking a two-pronged approach to staff preparation for changing organizational patterns and introducing new instructional resources. One was concerned with preservice "clinical" experiences and the other with inservice assistance to help staff adapt to and capitalize on educational change.

Preservice clinical experience activities focused on the preparation and role of cooperating teachers, use of joint appointments between schools and colleges, meeting special needs of urban teaching, and preparation and use of paraprofessionals on teaching teams. Steps were taken to stimulate self-assessment among teacher-preparation institutions in the region. The inservice program looked first at available new curriculums and changing school organization patterns and then devised materials and procedures to modify existing preservice programs.

UMREL also completed an experimental laboratory of study carrels, each equipped to illustrate a science concept and provide individualized instruction for both pre- and inservice science teachers. Staff also evaluated the effectiveness of sensitivity training to help school staffs adjust to change.

The Michigan-Ohio Regional Educational Laboratory (MOREL), Detroit, like FWLERD, Berkeley, and some other laboratories, has been concerned with developing strategies to train experienced teachers to engage in continual analysis and improvement of their classroom behavior. Simulation, microteaching, and other techniques are used to help teachers analyze their performance. To further this work, field testing has been going forward on the use of "field action units," a name given to a group of teachers in the same building who support each other's training through a common commitment to improvement.

In the projects known collectively as the Teacher Education Development Program, institutions designed models for broadscale reforms in teacher training for preschool and elementary school teachers. In phase I, grants totaling a little over $1 million were made to nine institutions whose proposals were selected from more than 75 entries received in response to a request for proposals to design comprehensive specifications for a model teacher education program. Support was awarded to Syracuse University, Teachers College of Columbia University, University of Pittsburgh, Florida State University, Northwest Regional Laboratory, University of Massachusetts, University of Georgia, Michigan State University, and University of Toledo. Final reports scheduled for October 1968 have been made available to other institutions seeking to reform and revitalize their elementary teacher education programs. Support for the entire Teacher Education Development Program is being held to a small number of institutions to avoid fragmentation of effort and to produce "showcase" demonstrations which promise strong impact on teacher education programs across the country.

Fiscal year 1968 support was provided to the American Association of Colleges for Teacher Education (AACTE), Washington, D.C., for the research segment of their effort to improve teacher education through application of better accrediting standards. The proposed standards stress innovation (including technology), research, commitment, clinical experience, and evaluation of competency reached. The AACTE also operates an ERIC clearinghouse on teacher education.

Several projects for the training of school administrators are particularly noteworthy. One was funded with the American Association of School Administrators (Washington, D.C.) to develop and test a model for a nationally based program for the continuing professional education of practicing school administrators, as distinguished from the preservice training offered by colleges and universities. Another was funded with the University Council for Educational Administration, Inc. (Columbus, Ohio) to develop concepts for restructuring preparatory programs for educational administrators.

Approximately half a million dollars of the 1968 appropriation for vocational education research and training was used for 20 institutes to provide professional personnel with information about the most up-to-date research and practice needed in carrying out their responsibilities. Programs were targeted on problem areas of decisionmakers at the State and local level so that participants could return home and help adapt or replicate programs for their associates. Occupational programs and administration together accounted for about three-fourths of the institute participation. Somewhat smaller institute investments were made in curriculum development, guidance, and other areas.

The following examples suggest the variety and scope of institute topics. Participants in one of the training programs in the administration area exchanged ideas for improving vocational education for inner-city youths. Those in another focused on materials and strategies for improving vocational education in correctional institutions. One institute developed an exploratory program to help junior and senior high school students who will seek early jobs get accurate occupational information and develop needed attitudes and skills. Still another used occupational analysis as a basic for curriculum development and explored ways to use curriculum innovations to provide training for emerging occupational fields.

Programs for educational researchers, as distinguished from other education professionals who work directly in the schools, is treated in a later section.

Improving school management and services

Student learning and curriculum efficiency are intimately related to and affected by school settings and services. The efficiency of these settings and services is in turn dependent upon the organization and administration of the school system and individual schools within it, the adequacy of library and other services available, the mixture of rural and urban responsibilities carried by the school, and the general school-community attitude toward educational change.

Educational organization and administration.— Numerous elements related to educational organization and administration have been investigated to help answer questions about planning, fiscal policy, staffing, evaluation, and other problems. An ERIC clearinghouse on educational administration is located at the University of Oregon, Eugene.

Two research and development centers have been studying the broad areas of educational organization and administration, but they focus on different elements. The Center for the Advanced Study of Educational Administration (CASEA), University of Oregon, Eugene, is working on the organizational implications of instructional change and the strategies for initiating organizational change.

The Center for the Study of Social Organization of Schools and the Learning Process (Johns Hopkins, Baltimore) is concerned more specifically with the effects of social and societal elements on school organization and administration, teaching, and learning.

CASEA has been researching the roles of school principals and teachers, the educational and community decisionmaking process, the politics of education, and the problems of school administrators in relation to the change process in schools. Their interest in rapid accommodation of change anticipates that, within the next 30 years, the utility of revolutionary teaching procedures will depend upon appropriate organizational and administrative arrangements.

In fiscal year 1968, Oregon's CASEA completed an examination of teacher survival rates, including the sifting and sorting process and its impact on schools. The center concluded that "It is *who* is employed as a teacher in the first place that makes a difference on the survival expectancies of teachers." For example, the older the teacher at the time of employment, the better the survival risk, although young men have better survival prospects than young women. Important differences were also found in factors affecting survival of elementary as opposed to secondary school teachers. This study concluded that, to the extent appropriate people can be recruited at the opportune time, administrators can alleviate some of the problems caused by rapid teacher turnover.

The Hopkins Center, during its first year (fiscal year 1967), at the request of the Office of Education, had concentrated on the general problem of school integration and its effects on students of varying racial and ethnic backgrounds. In fiscal year 1968, the Center was concerned primarily with the pragmatic effects the school social organization has on learning and with mechanisms through which these effects take place. Within this context, the Center explored various organizational and administrative arrangements, and studied racial, socioeconomic, and social structures among students and teachers, administrative and policy elements in relation to change and social mobility, and the way students learn in different social and administrative school situations.

The Southwest Regional Laboratory (SWRL), Inglewood, Calif. has been developing a question-and-answer technique in administrative planning. This was initially restricted to the area of personnel costs but is being expanded to include other planning capabilities. Also, the laboratory has been developing materials for inservice training of research personnel and curriculum resource developers and users. Among the self-instructional materials being developed and tried out were single concept packages to assist in teaching generalizable concepts; "how to" procedure guides; and packages which teach skills involved in developing instructional products.

The University of Florida completed an investigation of factors affecting local school fiscal policy. From a study of 122 school districts with 20,000 population and above in three States, investigators found that most school districts followed consistently high or low fiscal effort. The degree of effort was not necessarily related to socioeconomic factors. Rather, low-effort districts tended to have noncompetitive power structures and less-active voters.

From Phase II of a comprehensive project, the City University of New York released a comparative analysis case study of six large city school systems showing how fiscal status seemed to affect innovation and flexibility. The earlier Phase I of the study had included a survey of almost 2,800 school districts in terms of fiscal independence and other factors.

The University of Oregon issued an analysis of major issues and problems identified from interviews with school superintendents from various sized districts in 22 States. The project recommends inservice opportunities which should be provided to superintendents by colleges and universities, State agencies, regional laboratories, administrators' associations, and others. Also in the area of organization and administration, contracts have been let with the Association of School Business Officials Research Corp. (Chicago) and with the Dade County Public Schools (Miami) for the development and validation of a program planning and budgeting system for use by local schools.

Two vocational education projects funded at the close of fiscal year 1968 suggest other ways research funds may assist in planning for educational improvement. The National Planning Association (Washington, D.C.) received support for a systematic study of changing career opportunities and educational requirements to help identify priority areas for planning changes in vocational-technical education. The New Jersey State Department of Education (Trenton) was given support to develop a model planning, programing and budgeting system for vocational education at the State level.

Several studies have been devoted to improvement of school reporting and other information systems. For example, some of the activities at the Central Midwestern Regional Educational Laboratory (CEMREL), St. Ann, Mo., have been related to development and application of educational information systems to help improve educational planning and school organization and management. Efforts in this area include urban and regional educational planning, student-machine interface study, school data systems design, and directory-producing surveys of regional innovative practices and educational uses of computers. The goal is to join with other centers in making useful computer services available to widely dispersed education customers through economically feasible information storage, retrieval, and dissemination.

Columbia University reported on a computer system developed and tested as a planning tool for school administrators who wish to make effective use of mass transportation to achieve a better ethnic balance in schools.

The Iowa State Department of Education reported on a project to implement and test the use of computers in the school property accounting system presented in DHEW's handbook on the subject. Problems and advantages of computer collection were identified and procedures for updating information were developed and tested.

A survey and analysis of educational information was under way by the Association for Educational Data Systems (Washington, D.C.). The findings will help establish compatibility of information between educational agencies in such areas as personnel (staff and pupils), instructional programs, property, and educational finance.

Near the close of the fiscal year, the Interuniversity Communications Council, Bethesda, Md., received a contract to develop an Educational Information Network (EIN). The contracting agency was requested to evaluate existing and proposed networks and help establish working relationships to foster compatibility, avoid duplication of services, and discover additional capabilities that can be more widely accessible.

Evaluating instructional programs.—Instructional efficiency and cost effectiveness have been the focus of a number of research and development efforts.

The Center for the Study of the Evaluation of Instructional Programs (University of California, Los Angeles), was in its second full year of operation in fiscal year 1968. The Center focuses on program evaluation, not student evaluation.

A major goal is to develop and field test evaluation systems useful to teachers, school administrators, and boards of education. Studies on the evaluation of instructional programs include the concept and theory of evaluation, instruments and methods of evaluation, and the practice of evaluation at all levels and in simple and complex settings. Consideration is given to such variables as socioeconomic influences, teaching objectives, sequence of educational treatment and curriculum materials, and other factors which affect evaluation of instructional programs and school systems.

One aim of the Center is to develop information systems which will bring the results of continuous evaluation of ongoing school programs to the appropriate "users": classroom teachers, school principals, boards of education, and planners of higher education programs.

In fiscal year 1968, the UCLA Center was seeking to refine item sampling techniques to secure useful data from responses to a small number of items. This is particularly important to reduce the amount of test time needed to evaluate instructional programs. In related work, the Center also has been constructing a pool of achievement items to form the basis for measurement in a variety of subject matter combinations.

The Cooperative Educational Research Laboratory, Inc. (CERLI), Northfield, Ill., has been focusing on the roles of personnel in evaluating innovative practices and programs and implementing them in the schools. One technique has been to develop strategies for using "educational leaders" who work with small groups of their peers. In 1968, the laboratory also adapted the evaluation program to involve top level administrators and tested the efficiency of this approach in the Chicago schools preliminary to possible introduction throughout other areas. One example of the use of evaluators to help institutions assess innovative practices and programs has been CERLI's work with the Illinois State Program for the Gifted.

Project Talent data were used for an Indiana University study of the relationships between student performance and school size and per pupil expenditure. In general the findings indicated that expenditure was significantly correlated with performance, particularly that of children from better socioeconomic environments. There was also some evidence that increased class size was negatively related to most measures of performance.

In the vocational education area, researchers at the University of Wisconsin have been doing a comprehensive survey of vocational and technical education to serve as a base for measuring future progress. The American Institutes for Research (Pittsburgh) studied relationships between characteristics of high schools offering technical and industrial programs and the occupational experiences of their graduates and then made recommendations for program improvement.

Support has also been provided for cost benefit or cost effectiveness analyses of the economic effects of vocational education on a New England town (Princeton University study of Worchester, Mass.); on the relationships between cost and quality in representative New York school districts (Indiana University); on the comparative costs and benefits of vocational versus academic high school education (Pennsylvania State University); and on the cost and benefits of nonprofessional classroom aides (University of Oregon).

Library and information sciences.—Most of the support available for library and information sciences research in fiscal year 1968 went for studies to improve services to users, but some support was also provided to secure information about effectiveness of the Federal investment in libraries.

Expenditure limitations near the close of the fiscal year held library research obligations to a little over $2 million out of the $3.55 million appropriated. Funded projects were focused on curriculums for training librarians and updating their skills; applications of computers to library administration, technical services, and automation of bibliographic activities; expansion of information and user services; and expanded use of microforms to preserve materials and reduce space requirements. An ERIC clearinghouse on library and information sciences is located at the University of Minnesota, Minneapolis. The following examples suggest the variety and scope of supported activities.

The National Book Committee, Inc. (New York City) received support for the first phase of a four-part effort to improve education by better integration of library services and instructional programs. The study will begin by identifying and analyzing current successful practices in bringing users and materials together and work toward developing guidelines for model centers which can be demonstrated and implemented.

Because many libraries are considering possible automation of their cataloging operations, R&D Consultants Company (Los Altos, Calif.) was given support to examine catalog costs, broken down by various components to simplify comparison. Besides assembling and analyzing data from different types and sizes of libraries, the study will estimate the costs of detecting catalog errors.

Trends in the application of computers and other automatic equipment in library systems were being analyzed by Information Dynamics Corporation

(Bethesda, Md.). Staff were investigating particularly the automated techniques and procedures in Federal library and documentation centers.

The University of Pennsylvania (Philadelphia) was given support for a systematic and comprehensive investigation of the collection, processing, dissemination, and managerial uses of library and information science statistical data. The study is aimed at meeting the serious need for coordinated data systems for all kinds of libraries and information centers.

The Catholic University of America (Washington, D.C.) has been using 1968 support to launch the first phase of a research and development program to update the post-master's training of middle- and upper-level personnel for libraries and information centers. Project staff will analyze the training needs in phase one. Then they will develop models for specialization to improve the present Master of Library Science degree program and field test and refine the models in practical situations.

Among other studies, one identified useful materials currently available to the adult who has recently learned to read; one determined library and related resource requirements of school children in urban areas. Another project was investigating future requirements of microform technology and identifying the characteristics of ultramicrofiche that may warrant their application to college and university libraries. Projects examined the use of programed instruction and computer-assisted instruction for preparing librarians to apply new technologies to library operation. Still another was concerned with specifications for effective development and operation of educational materials centers, many of which are funded under Title III of the Elementary and Secondary Education Act.

Some library research was carried out in connection with improving the total Federal investment in libraries—for example, to determine the effect of Federal investment under the Library Services and Construction Act upon the development and expansion of library services.

Staff responsible for administering the library and information sciences research program helped develop a curriculum for training institutes funded under authorizations administered by the Bureau of Adult, Vocational, and Library Programs for educational information specialists (staff of schools and State agencies involved with information service or reference activities). Results of current information sciences research were a functional part of these institutes. For example, System Development Corporation (Falls Church, Va.) received support to prepare and evaluate a manual for developing and operating local information centers. The manual was to be field tested in the training institutes, revised, then published for wide dissemination. Institute participants also used draft copies of other guides to information sources and systems, such as those prepared under contracts with American Institutes for Research in Behavioral Sciences (Silver Spring) and Herner & Company (Washington, D.C.).

To determine the effect Federal funds have had on the development and expansion of library services, the Office contracted with System Development Corporation (Santa Monica, Calif.) to carry out a detailed overview of programs under the Library Services and Construction Act. The analysis, based on representative programs in 11 States, will yield important information about State programs—their intent, approaches, and areas of success or failure—and suggest ways to improve the effectiveness of the total Federal program.

Management of rural and urban schools.—Many of the problems and responsibilities faced in the management of a large urban or suburban school are quite different from those in an isolated rural school. Out of the 1968 research investment, about $9 million went for activities related to urban schools, including the central city and urban fringe, and about $4 million for educational improvements in rural schools. This investment ratio is a deliberate response to growing problems of urbanization throughout the country.

Educational improvement in urban or rural areas was a major mission of programs at three educational laboratories. The Center for Urban Education (CUE), New York City, a laboratory which evolved from an earlier research and development center, has as its goal the improvement of educational practice within metropolitan areas, particularly education of the disadvantaged. To reach this goal, the Center has been developing improved educational programs and models for school-community interaction and providing related services in educational personnel development, social and field research, evaluation, and dissemination.

CUE has been supporting the continuous development of curricular materials and methods for disadvantaged prekindergarten children. In fiscal year 1968, various beginning reading approaches were being field tested in 50 New York City schools. Instructional programs were also being field tested in science, mathematics, the arts, and social studies for the early grades. The effects of preschool Montessori training were also being evaluated. Plans were under way to develop multicultural programs that take into account the vocabulary urban children acquire in their nonschool experiences.

CUE staff concerned with community development have been working with metropolitan areas to reduce inequalities in their educational services and provide effective community participation in the schools. Some help has also been given to school systems seeking to develop and implement effective integration programs—for example, in Bridgeport, Conn. and Glen Cove, N.Y. The concept of educational parks and the effects of school decentralization have also received attention.

In fiscal year 1968, CUE developed and started field testing an "urban planning" unit to encourage problem-solving in social studies in the elementary grades. The unit will eventually be part of a curriculum including such topics as civil rights, criminal law, intergroup attitudes, and subcultural affairs, as well as simple social science concepts.

The Appalachia Educational Laboratory (AEL), Charleston, W. Va , has been seeking an effective way to attack educational problems caused by the geography and isolation of the Appalachian region. It is committed to the stimulation of a network of "educational cooperatives" which use media, technology, and shared resources to upgrade the quality and breadth of education in Appalachia.

In fiscal year 1968, the laboratory designed specifications for model cooperatives, including management and operating procedures, equipment and facilities, and selection and training of necessary personnel. Field sites were established where specific components of cooperatives can be tested and their interrelationships with schools and other agencies can be further refined.

AEL staff were helping develop or adapt curriculums and materials for instructional media to allow sharing in three major areas: (1) Vocational guidance using radio and television for job orientation, occupational information, and placement; (2) home-oriented preschool programs, to compensate for the absence of kindergartens through use of television and mobile facilities; and (3) an Appalachia-focused language program to attack dialects and other regional language problems. The use of an electrowriter system and a telephonic link to facilitate course-sharing was also being field tested.

The Northwest Regional Educational Laboratory (NWREL), Portland, serves a large region (from Alaska to Montana and Idaho) characterized both by rural isolation and poverty and by growing inner-city problems. Staff helped regional and community education agencies design, field test, and install model school programs that meet special needs of such varied groups as Eskimo and Indian children in remote villages and the disadvantaged in crowded ghettos. Fiscal year 1968 accomplishments also included a demonstration summer counseling program, curriculum modules for inner-city schools, and readers for Eskimo children.

Special assistance to isolated schools which cannot be consolidated because of climate or topographic conditions has been provided in the form of multimedia and self-instructional curriculum materials and guidance programs. Materials have been developed and field tested in speech, vocational mathematics, and industrial arts, and prototype units have been produced in science, advanced mathematics, and Spanish. Some work has been done to help teachers manage student learning through use of self-instructional curriculum materials.

Another of NWREL's major activities has been the application of research findings and technological developments to classroom practice through inservice teacher training. One group of activities in this area is concerned with inquiry training to develop student abilities to acquire, process, and use new knowledge; and another consists of techniques to help school personnel analyze classroom instruction. NWREL also has been designing a center to demonstrate computer usage for instruction and administrative management.

An ERIC clearinghouse on rural education and small schools is located at New Mexico State University, Las Cruces, and one on educational facilities is at the University of Wisconsin.

Special studies.—Special studies carried out in keeping with 1968 budget authority included a national achievement study and certain evaluations and statistical surveys.

Preliminary work toward the National Achievement Survey (National Assessment) authorized by the 90th Congress was carried out by the Committee on Assessing the Progress of Education (CAPE), Ann Arbor, Mich., with funds from OE and the Carnegie Corporation of New York. The achievement study will provide dependable analytical information about the educational attainment of the population at four different age levels (9, 13, 17, and 26–36). Data collected from a scientifically selected sample of the population will yield reliable information about educational attainment of groups or subgroups classified according to: (1) age; (2) sex; (3) socioeconomic status; (4) demographic setting; and (5) region. Individual respondents, schools, and States will not be identified or identifiable.

In fiscal year 1968, budgetary authority provided for using a limited amount of Cooperative Research funds for contracted studies formerly carried out by the National Center for Educational Statistics under "Salaries and Expenses" appropriations. These funds were employed to survey users of educational statistics and ascertain their current and anticipated uses of data; to develop survey instruments and data collection procedures; and to design a national plan for a system of library statistics.

Evaluation studies were concerned with effectiveness of certain federally supported programs, particularly those for the disadvantaged. For example, a grant to the United Planning Organization (Washington, D.C.) was used for the research and demonstration components of the Neighborhood Development Youth Program. This program was already receiving interagency support, primarily from the Department of Labor and the Office of Economic Opportunity, to develop centers and services to raise the educational and social goals of ghetto residents of all ages, particularly youth who have become disaffected.

A project at St. Johns University (Jamaica, N.Y.) received support to find out what happened to about 200 projects at the expiration of initial Federal funding under Title III of the Elementary and Secondary Education Act.

Ball State University's final report on the feasibility of kindergartens in Department of Defense Overseas Dependents Schools became available in fiscal year 1968. Based on site visits of available facilities, the project defined curriculum needs, provided equipment and supply lists, and recommended qualifications for professional and paraprofessional personnel. From another project, the University of Miami provided an evaluation of National Science Foundation programs to promote interest in scientific careers among selected junior high school students.

Several projects not related to federally supported programs have national implications. For example, Stanford University was in the midst of a 3-year project to determine how education affects the economic-political-social development of nations. Case studies of education in underdeveloped countries on five continents were analyzed to determine what kind of subject matter and instructional methods have greatest impact, both positive and negative. This analysis was the basis for constructing and field testing general and occupational curriculums and assisting in implementing educational improvement strategies. Besides providing information on the education of culturally and socially deprived populations abroad, this project should uncover techniques appropriate for use with similar populations in the United States.

At Princeton University investigators were carrying out a cross-cultural analysis of relationships between educational and national goals. The initial phases focused on the United States; later stages included five European nations that share the western political tradition—Denmark, England, France, Italy, and West Germany.

Investigators of a Rutgers University (New Brunswick, N.J.) project used an anthropological approach to compare relationships between education and sociocultural systems in the United States and Israel, both of which are made up of diverse nationalities. Specifically, the study looks at three basic questions: the education system in relation to the intergrating forces of society, patterns of access to or self-selectivity into different segments of the education system, and the psychosocial consequences of formal education.

The objective of all of these cross-cultural or trans-national studies is to gain a broader and more objective view of educational consequences as a basis for long-range improvement of teaching and learning in the schools.

Facilitating promising changes

Educational improvement requires change. Implicit in bringing about such change is the conceptualization of goals and the understanding of alternatives for reaching those goals.

In February of 1968, awards were made to centers at Syracuse University Research Corporation (Syracuse, N.Y.) and at Stanford Research Institute (Menlo Park, Calif.) to conduct a continuing examination of future educational needs and resources. These two centers were selected from among five pilot studies which had been exploring alternative future goals and designing model frameworks for providing the assistance needed for educational decisionmaking.

Four major questions concern the centers: What will society require of schools in the future and how should schools prepare for these new demands? What should be the immediate and future curriculum objectives and what are their implications for schools today? What resources will be available to schools in the future and how might this affect planning today? What technologies will be available to schools in the future and what are their implications?

The center at Syracuse started examining alternative projections for society in the years 1980 to 2000, based on such diverse factors as economic growth, technological development, family structure, population distribution, and changing human values. The center at Stanford Research Institute focused its initial attention on varying individual needs in the year 1990. Attention also will be given to analysis of policymaking for urban ghetto education and to new methods of social forecasting.

The mission of the centers is to provide educational policymakers in schools, colleges, and education agencies at all levels with information and techniques that will aid them in decisionmaking and in planning for their future needs. Specific projects will study decision formation in local schools, evaluate methods for exploring the future, predict the attitudes and values of future decisionmakers, forecast the probable roles of teachers and administrators, and investigate the future roles of local school boards.

Educational laboratories have played a major role in facilitating promising educational change. Much of their work is based on the theory that the potential for change depends upon the compatibility of present and alternative programs and practices, and the receptivity to change by the staff and the local community.

A major effort to create ways to design, refine, and engineer promising school systems comprised of compatible elements is being undertaken by the Eastern Regional Institute for Education (ERIE), the laboratory based at Syracuse, N.Y. ERIE's work has been primarily in three areas: a process approach in science, a cross-disciplinary instructional system, and a complete system based on IPI.

By fiscal year 1968, "Science—A Process Approach" had been installed in 19 elementary schools and ERIE was providing biweekly assistance and data collection. The laboratory also trained teachers and administrators to install this science approach in 57 additional schools, and 20 university professors to serve as consultants to local programs. The process approach is part of a larger effort to design a system for installing and monitoring new curriculums in schools of diverse characteristics. Staff produced an engineering "manual," using a multimedia approach to show other schools how a new curriculum may be adopted successfully.

In another program, called ADEPT (Across Disciplines Education—Process Tactics), ERIE aims at increasing competence in those general learning processes underlying various subject-matter disciplines. Following the designing of a model, the staff has been working on further refinement of cross-disciplinary instructional materials for the system.

The Far West Laboratory for Educational Research and Development (FWLERD), Berkeley seeks to bring about educational improvement by concentrating its efforts on creating programs and techniques to enhance the effectiveness of school personnel. Building on the microteaching research conducted at the Stanford Center for Research and Development in Teaching, the laboratory has been developing self-instructional course packages for training experienced teachers to use a variety of specific instructional skills. In a typical unit, called a "minicourse," the teacher studies the instructional materials, teaches a short lesson which is videotaped, compares her teaching with that of a model teacher on videotape, and then reteaches the lesson to make improvements. The first minicourse was designed to improve the teacher's questioning skills. Ten additional minicourses have been developed to various stages.

FWLERD has used several approaches to improve the means by which school personnel are informed about alternative ways to improve classroom learning. Television programs and written materials have been used to develop favorable attitudes about research and its utilization. Videotapes and other materials on new techniques or programs have been prepared and distributed for regional field testing. In the 1967–68 school year, FWLERD sponsored a weekly television series on educational developments and innovations, worked on model information dissemination practices, and investigated organizational arrangements that support effective use of research information in schools. The goal is to motivate and facilitate rational planning for adopting promising educational innovations.

The Educational Development Center, Inc. (EDC), Newton, Mass., has been concentrating on community involvement in educational change. This laboratory was created through a merger (January 1967) of Educational Services, Inc., a curriculum development corporation, and the Institute for Educational Innovation, which had been established as the New England regional educational laboratory.

One of EDC's major accomplishments in fiscal year 1968 was the implementation of a Pilot Communities Program to refine strategies for helping localities improve the quality of their educational programs. Initially, resource teams and resource centers were working with four communities: Bridgeport (Conn.); Brunswick-Rockland (Maine); Boston; and the Model Subsystem, Cardozo District (Washington, D.C.). Each resource team (1) involves local agencies in planning and taking advantage of resources with promise for significant local impact, (2) arranges planning conferences, staff development activities, and demonstrations; and (3) provides access to new instructional materials and general professional assistance.

In the Cardozo district, for example, the laboratory conducted summer training for a 14-member innovation team of teachers already in the system. These teachers in turn helped 400 other teachers learn to use new techniques and materials more effectively. The objective is to help localities determine the potential of educational innovations in their own settings and manage the educational engineering necessary to implement those which are most promising.

The Central Atlantic Regional Educational Laboratory (CAREL) helped the Washington, D.C., school system to implement recommendations made by an evaluation committee from Columbia University and provided assistance to nearby school systems in planning cooperative special education programs.

Research for Better Schools, Inc. (RBS), the Philadelphia-based laboratory has been studying research implementation teams as a means of assisting superintendents in decisionmaking. Staff have been seeking to specify the types of personnel needed to bring about change and then develop course materials to train school personnel for the identified roles. By 1968, teams were working with the Delaware State Department of Education, the New Jersey Urban Development Council, and some Title III centers in Pennsylvania.

Most strategies for educational improvements are initially conceived and tested as promising local experiments. During 1968, the Wisconsin Learning Research and Development Center tested a "multiunit" environment as a substitute for the traditional self-contained classroom. In this new organizational pattern, instructional units are composed of a unit teacher specialist, certified teachers, teacher aides, and students. In a multiunit school, unit leaders and the principal comprise the instructional decisionmaking committee. The center's 1968 studies found that children in multiunit environments showed substantial gains over control groups in spelling, language, vocabulary, and arithmetic. Dramatic field test results were obtained in one school serving disadvantaged children. By thus devising and testing new approaches, research and development helps to make promising alternatives readily available for effective educational improvement.

DISSEMINATION

In its broadest sense, dissemination facilitates the engineering of change by local schools and school systems.

In fiscal year 1968, major dissemination functions were carried by the Educational Resources Information Center (ERIC) and affiliated clearinghouses, and by the targeted publications program designed to bring syntheses of research and development results to specific groups of users. Many projects had dissemination components, which were carried out in connection with other major functions, and a few studied dissemination as part of the change process. Clarification of copyright policy was an important step in furthering dissemination of research products, particularly of curriculum materials developed in supported activities.

Educational Resources Information Center (ERIC) System.—All phases of the ERIC program were expanded during fiscal year 1968. One new clearinghouse (Teacher Education) was established during the year and six of the other 18 were in their first full year of operation. As clearinghouses became operational, they increasingly shifted their major efforts from documentation and retrieval to information analysis and other dissemination-related services. The latter include assistance with on-site reference work by domestic and foreign educators, response to correspondence and telephone inquiries, and preparation of a wide variety of materials for distribution. An analysis of those who requested services showed that teachers and other practitioners comprised the largest group (estimated at 41 percent of requests for information), followed by administrators or decisionmakers (22 percent), research and development interests (10 percent), and "other" (27 percent).

The 19 clearinghouses received and processed about 35,000 new documents during the year. Of these, about 25,000 were judged to be of some value and retained. Roughly half of those retained (12,000) were reported in ERIC's monthly abstract journal, *Research in Education* (RIE). Clearinghouse dissemination activities included publication of 12 newsletters, and release of 92 major bibliographies and 55 review papers or monographs. In addition, ERIC clearinghouses were involved in preparation of material for regular columns in numerous professional journals.

Research in Education was expanded from 98 report citations in June 1967 to 795 in June 1968. During the same period, paid subscriptions rose from 2,643 to more than 4,000. An April analysis showed that 36 percent of these were colleges and universities, 29 percent State and local agencies, 13 percent individuals, 12 percent commercial organizations, and the remainder foreign subscribers and associations. In addition to paid subscriptions, more than 1,000 copies are distributed free to educational organizations, government agencies, and other users.

Beginning with the January 1968 issue, RIE was converted to a new format employing computerized photocomposition techniques, for improved readibility and greater page compaction. Arrangements were made to move editing and copy preparation from the west coast to a Washington facility.

Microfiche sales from the ERIC Document Reproduction Service (EDRS) were about 6 million in the 1968 calendar year, compared with 1.2 million for the previous year. Documents in hard copy showed similar increase. Standing orders to receive all ERIC documents cited in RIE reached 122 in June 1968, up from 40 a year earlier. More than 90 percent of these orders were from colleges, universities, and State and local education agencies. In addition, 60 full collections were provided to regional laboratories, OE regional offices, clearinghouses, Library of Congress, HEW library, and several sites in the Office of Education. As a result of competitive bidding, the National Cash Register Company replaced Bell & Howell as contractor for EDRS operations. At the end of the fiscal year, plans were going forward to disseminate ERIC files via magnetic tape and to develop an on-line remote access capability.

Specific collections through Central ERIC in fiscal year 1968 included indexes to the previously distributed higher education collection; a historical collection, including résumés and indexes for research reports between 1956 and 1965; volumes of Title III ESEA *Pacesetters in Innovation* for fiscal year 1966 and fiscal year 1967; and an Interagency Commission's *Manpower Research Inventory* of supported projects. Other products, besides *Research in Education*, included the 1967 Annual Index to RIE, containing cumulative listings for the first 14 issues, and the *Thesaurus of ERIC Descriptors*. The Thesaurus initially contained about 3,100 descriptors and was later supplemented with 400 additional terms and a rotated display of descriptors.

In response to requests from professional library and information science circles, staff papers about ERIC were presented at meetings of a variety of associations, and an ERIC exhibit was displayed at several conventions and conferences. A contract was let to Herner & Company (Washington, D.C.) to study education journal literature and related abstracting and indexing services and recommend how ERIC should proceed in covering journal resource information.

ERIC Management Notes (EMC), Central ERIC's internal management newsletter, was developed as a tool to communicate on a regular basis with the various components of the ERIC system. It reviews program guidelines, management decisions, and operating procedures, announces system changes and adaptations, makes progress reports on ongoing programs and highlights new program developments. It also reports general information notes of interest to the program network. ERIC Management Notes began in August 1967, gradually moving toward regular monthly publication and circulation throughout the operational components of the ERIC system.

Other systems which carry out major dissemination responsibilities include the State Research Coordinating Units established with support for vocational education research and training and the Instructional Materials Centers funded under provisions for handicapped children research and demonstration.

Besides helping to prepare bibliographies and review papers in support of important conferences, clearinghouses sometimes carry out research-related projects and work with national organizations to abstract, index, and otherwise preserve conference proceedings and papers and to unify previously fragmented and sometimes duplicated efforts. For example, clearinghouses on modern languages, linguistics, and English worked with four related professional organizations to prepare a comprehensive annual bibliographic system for all phases of modern language activity. Another cooperative endeavor is the data bank of validated instructional programs being pursued by the Clearinghouse on Media and Technology and the National Society of Programmed Instruction.

Near the close of fiscal year 1968, Oregon College of Education (Monmouth) received a grant to further refine a system for ERIC Documentation of State Education Department Publications (EDSEP) to facilitate the sharing of pertinent publications from State education agencies and large city school systems.

The American Institute for Research in Behavioral Sciences (Bethesda, Md.) has been carrying out research and analysis to define clearinghouse requirements for the 1968–71 ERIC system. From their findings will come recommendations on the nature, number, and order of acquisition of clearinghouses to service the educational needs of users.

Targeted communications and other dissemination projects.—The Targeted Communications Program was started late in fiscal year 1967 to keep practitioners informed through interpretive reports of significant findings on educational research, development, and current practice. Under contract with the Office, authorities in various fields collect, synthesize, and interpret these findings and prepare their reports for specific educational audiences.

Three of the first interpretive-report contracts were completed in fiscal year 1968. One from Brooks Foundation (Santa Barbara, Calif.) is a planning guide for instructional television (ITV) facilities. Sections form a comprehensive handbook on topics ranging from ITV concepts to production and utilization.

A second interpretive report is on facilities planning, to be issued as two publications, one on community colleges and one on vocational high schools. The report was prepared by the Council of Educational Facility Planners, Columbus, Ohio.

The third, from Indiana University Research Foundation, Bloomington, reports on research and current classroom practice in reading, one of the most controversial areas in education. The four parts of the report are directed to different audiences concerned with reading difficulties—the principal, the classroom teacher, the reading specialist, and the administrator.

Five new projects, funded under the Targeted Communications Program late in fiscal year 1968, will produce interpretive reports during the following year. These are in the areas of rural shared services (Northwest Regional Educational Laboratory, Portland), methods of disseminating and implementing information on educational innovations (University of Michigan, Ann Arbor), bilingual education (University of New Mexico, Albuquerque), school-industry cooperation in establishing job-oriented education programs (University of Tennessee, Knoxville), and the use of paraprofessional aides in teaching and administration (Stanford Research Institute, Menlo Park).

For targeted publications or any kind of research reports to be most effective, it is first necessary to understand how and under what conditions change occurs, what the information needs of the audiences are, and how innovative ideas reach their targets. In fiscal year 1968, a project was funded with George Washington University (Washington, D.C.) to develop a blueprint for improving the dissemination and use of Government-sponsored nonprint educational materials (films, video and audiotapes, models, displays, and the like). Results of this project, scheduled for completion in fiscal year 1970, will be used to design a governmentwide program to make audiovisual materials readily available at lower costs to educators and the public.

Another project designed to help educators keep up to date on educational advancements has been undertaken by Southern Education Reporting Service (Nashville) to disseminate special materials about noteworthy local programs financed under the provisions of the Elementary and Secondary Education Act. Descriptions of about 60 selected projects were prepared by professional journalists in nontechnical language for dissemination to education editors of mass media and others seeking examples of activities supportable under the Elementary and Secondary Education Act.

The Educational Materials Center, operated by staff affiliated with the Bureau of Research, continues to be a focal point for display of textual and related materials for numerous foreign and domestic educators. By the end of June 1968, approximately 15,000 books and other materials were housed in the Center. Under a contract with George Washington University, work was begun on the following bibliographies: (1) Education: Literature of the Profession (7th edition); (2) Adult Basic Education; (3) Elementary and Secondary School Books Related to the Social Studies; and (4) Text Materials and Children's literature for Compensatory Education. A contract was also received from the Agency for International Development to evaluate the effectiveness of textbook depository libraries supported by that agency in a number of foreign countries and to make recommendations on future operation of these libraries.

Near the end of fiscal year 1968, arrangements were completed to move the Educational Materials Center to the Federal City College in Washington, D.C., the Center and its staff to remain administratively part of the Office of Education.

Copyright policy.—Publication of a new limited copyright policy in the Federal Register of March 1, 1968, promises to help resolve many problems related to the July 1965 policy of placing in the public domain all materials produced with research contract or grant support. The earlier practice was established to improve the availability of materials produced with Federal funds. However, publishers hesitated to invest in new materials which could not be protected against unfair competition during initial printing and marketing. As a result, strict adherence to the original public domain policy was a deterrent to education-industry cooperation in disseminating curriculum materials and in developing compatible hardware and software for the newer educational technology.

In effect, the new policy opened the door for limited copyright protection to keep materials from falling into the public domain prematurely while they are being developed, tested, and evaluated. It also provided an incentive to promote the production and effective dissemination of finished materials.

"Materials" is defined to mean writings, sound recordings, films, pictorial reproductions, drawings or other graphic representations, computer programs, and works of any other similar nature produced or specified to be delivered under grants or contracts.

In requesting limited copyright authorization, the grantee or contractor must show that copyright protection will result in more effective dissemination and otherwise be in the public interest, give evidence that the materials are being made available to an adequate sample of producers, and provide other information pertinent to the request. On the basis of this information, a contractual agreement is arranged to give appropriate protection to public and private interests in the materials to be produced.

With the announcement of the new policy, a copyright program officer was added to the Bureau of Research professional staff to operate the program and to advise the Office on copyright considerations which will broaden dissemination activities in keeping with suggestions in the legislative history of recent authorizations and amendments.

Some background information for establishment of this new copyright policy was provided by a study completed by the Committee to Investigate Copyright Problems (Washington, D.C.). Library research appropriation money was provided for this investigation to determine the legal facts and economic guideposts with respect to dissemination of educational information as it is affected by copyright.

EDUCATIONAL RESEARCH TRAINING

The 1965 amendments to the Cooperative Research Act provided the initial authorization for support of educational research training, to improve the competencies of those already in the field and to add to the number of trained researchers. At the inception of the training program in 1966, it was estimated that only about 2,200 persons were engaged primarily in educational research in the United States. Their preparation varied widely and, to the extent a pattern could be discerned, experiences of practicing researchers leaned heavily toward educational psychology. The legislative history of the authorization points out the strong demand for more and better trained personnel, particularly in curriculum development, social components of education, and strategies for moving from research to practice. The Research Training Program provides support for career training, intensive short-term sessions, and institutional program development to help satisfy this demand.

During the first two years of the program, approximately 4,500 individuals received either short-term or advanced educational research training. Fiscal year 1968 funds supported direct training for 2,292 individuals. Numbers alone can be misleading, however. Five out of eight of the fiscal year 1968 participants were in short-term intensive training programs designed to upgrade the competencies of those already required to carry research responsibilities. Because of fund limitation, none of the career programs were allowed to grow and no new ones were started. The actual number of participants in graduate programs—the primary source of research career training—was only 810, no larger than in the previous year. This was the second year that funds had not been available to cover initial enrollment increases in implementing continuous 3-year programs. As a further result of budget stringencies, the undergraduate program, originally designed to attract promising students to graduate specialization, was curtailed altogether and the funds were used to relieve some of the immediate pressures for institutes and other intensive research training.

The relative newness of research training as a profession is reflected in the titles and descriptions of the various graduate "programs" among participating institutions. Some institutions stress the interdisciplinary nature of their programs; others emphasize specialization. Some of the larger programs are operated under single grants for a coordinated total offering in which students choose their special course work and practicum. Other institutions have separate "programs" for specialization under recognized resident researchers. About five out of six of the institutions offering graduate programs provide work leading to the doctorate level; the others provide programs leading to master's degrees or special certificates. Some institutions which started with separate programs are now combining and coordinating certain basic elements as the programs become established and operational.

Graduate and postdoctoral program.—More than four-fifths of the Educational Research Training Program budget is directed toward the preparation of fully trained professional researchers. Highly talented persons from a variety of disciplines are recruited for graduate training. Interdisciplinary programs are encouraged, as is interinstitutional cooperation. The variety and scope of graduate training is suggested by the following examples.

At the University of Connecticut, Storrs, a graduate training program stressing computer applications is designed to help researchers cope with innovative educational settings, using their computer competence, particularly in the important new field of natural-language analysis. The University of Michigan, Ann Arbor, offers an interdisciplinary program and also specialization in such fields as institutional research, music education research, and research in social science education and in educational sociology. Indiana University, Bloomington, has a program which specializes in audiovisual communication research and another for experimental researchers; and the University of North Dakota, University Station, trains educational researchers for rural America.

The postdoctoral training program is designed to provide outstanding educational researchers already in the field with an opportunity to develop new research techniques and investigate emerging areas of study. These are persons who have already made outstanding research contributions and whose past training and experience can quickly be redirected to serve current and future needs. In fiscal year 1968, 20 postdoctoral fellows were selected from more than 100 candidates. One found it necessary to withdraw and the other 19 were supported in programs at 18 institutions.

Institutes and other short-term training.—Support available as a result of discontinuing the undergraduate training program was used to strengthen institutes and other short-term programs. This made it possible to provide training for a greater number of educational research directors and related staff already in the field. The 17 awards for these programs enabled 1,462 trainees to participate at a total cost of $433,485, an average of a little under $300 per trainee.

These programs ranged from brief institutes lasting a few days to more detailed ones lasting several weeks. They included training for information center personnel, central office researchers, and research personnel in art and other special areas.

One short-term training program funded in fiscal year 1968 was conducted by the Research Council of the Great Cities Program for School Improvement (Chicago), which represents school districts from the 17 largest cities in the country. In this program, training in evaluation research was provided for 128 research directors and research and evaluation staff from the participating school districts. Participants learned the latest techniques needed to evaluate new projects, including those funded under Titles I and III of the Elementary and Secondary Education Act, as well as to improve established programs.

Special emphasis also was given to short-term training programs held as pre- and post-sessions to national and regional meetings of major professional organizations which have interests in educational research. This arrangement was found to be highly effective in providing intensive training to groups of researchers facing common or similar problems.

Another approach to the building of research competencies is reflected in a University of Minnesota (Minneapolis) project which conducted two coordinated regional networks of institutional research. Each 11-day workshop included participants who were assigned or were about to assume responsibility for institutional research, including institutional self-study. Case studies, simulated studies, and raw data were used to help participants develop institutional research reports for decisionmaking, internal management, and planning for effective operation.

Program development and other activities.—A total of $211,000 of fiscal year 1968 funds were expended to develop and improve research training programs at 22 institutions. Some of these institutions developed new programs; others developed needed specializations within existing programs.

Special projects which did not fall under the above categories included two internship programs. One was operated by the Michigan State Department (Lansing) and provided training in State and local educational research; the other was by the University of Illinois (Urbana) and provided training in demonstration and dissemination.

The direct investment in the Research Training Programs can be expressed in precise amounts for fiscal year 1968, but the indirect training investment included in other activities can only be estimated. Formal and informal research training experiences are provided in various degrees in the laboratories and center-type activities, in the ERIC clearinghouses, and in the State vocational education Research Coordinating Units. There are training elements in activities funded as research development grants and vocational personnel institutes. In all of these instances, however, training is incidental to some other primary function.

Several studies have been concerned with the scope and adequacy of research training. Support was used by the Bureau of Applied Social Research, Columbia University, to analyze the total Research Training Program and make recommendations for improvement. The final report, which became available in January 1968, recommended the increase of interdisciplinary training elements to balance offerings oriented toward education and psychology. Support also was provided to Indiana University Research Foundation (Bloomington) for a study of research development and diffusion manpower needs.

THE CONTINUING CHALLENGE FOR RESEARCH

In fiscal year 1968, there was a continuing tension between demands for development activities to create or identify the means for immediate educational improvement and demands for basic studies to answer some of the major questions required for long-range decisionmaking and continuous improvement. In the previous year, the investment in all kinds of basic studies had been approximately equal to the investment in development and demonstration. Together they accounted for about three-fourths of the total, while dissemination and training shared almost equally in the other one-fourth.[1] By 1968, however, the practical demands for products and practices to cope with current crises had grown so great that almost half of the total research investment was going into development, while only a third went into basic studies and other research for longer range improvements. Seven percent went into dissemination, 8 percent into training, and 5 percent into evaluation. At this point, to avoid mortgaging the investment in future improvements in order to respond to the exigencies of the moment, arrangements were made with the National Research Council, working through an advisory committee (Committee on Basic Research in Education) to provide recommendations about needed basic research.

By 1968, the initial regionality of the laboratories had served to bring people and resources into the cooperative effort, had helped to crystallize problems to be attacked, and had helped provide settings for testing new programs and practices. Laboratories and centers were increasingly coordinating their development efforts, each doing those development activities for which it was best qualified.

Earlier exploratory research in using the newer educational technology was beginning to fall into patterns which could be pursued more systematically. The social elements and responsibilities of education were becoming more precisely defined for investigation and resolution. This was evident in efforts to improve programs for the handicapped, minority groups, and the socially and culturally deprived, and to identify emerging new careers and prepare students for broad career options.

Attention to curriculum content improvement took into consideration the rapid growth of knowledge itself, the newer approaches to effective teaching and learning, and the sequencing of materials to help students advance at their own individual rates. On the whole, supported research was increasingly focused upon solutions needed by the educational enterprise, upon development to improve ways to *do* what can be done, and upon improved dissemination to provide the basis for informed action. Researchers were showing increased ability—and willingness—to undertake more comprehensive, and less fragmentary, studies. At the same time, staff in the Office of Education and their nongovernmental advisory groups were sharpening their precision in selecting and fitting together the various research and development activities needed for a balanced total effort to improve education.

The local ferment for educational improvement was bringing greater demands for information about research and innovative practices, and the Office of Education was responding with more effective citation of ongoing and completed research and analyses of research findings. Progress was made in developing systematic strategies for looking at future educational needs and resources as a basis for educational decisionmaking, and training efforts were responding to positive pressures for educational research manpower to facilitate continued improvement in the years ahead.

As a consequence of all of these factors, the total research effort in fiscal year 1968 was characterized by larger concentrations upon particular objectives than in previous years. At the same time, a precise allocation for small project research encouraged broadened participation in the research effort, and some funds were reserved for exploratory work in unforeseen problem areas. On the whole, however, total research support funds available in fiscal year 1968 were not sufficiently above the 1967 level to meet the increasing pressures for research results; and OE salary and expense limitations forced continuous stringencies upon the staffing needed for sound administration.

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[1] *Improving Education Through Research, Development, Demonstration, Dissemination, Training,* Fiscal Year 1967 Annual Report, Bureau of Research, U.S. Office of Education, pp. 11–12 (OE–12041).

Since the initial funding of the cooperative research effort in fiscal year 1957, the Federal Government has substantially increased its commitment to the support of educational research and related activities aimed at improving the quality of education at all levels. However, measured against the yardstick of social and technological change, educational research must forge steadily ahead if the schools are to have the new programs, the new techniques, and the new materials so vital to fulfilling the needs of today's students and tomorrow's citizens.

APPENDIX A.—THE RESEARCH ADVISORY COUNCIL

Functions

The Research Advisory Council, a 12-member[1] non-Government body appointed by the Secretary of the Department of Health, Education, and Welfare, advises the U.S. Commissioner of Education and the Associate Commissioner for Research. Its functions include the following:

(1) *Policy Review.*—The Research Advisory Council's advice is sought on specific proposals or projects or groups of proposals and projects which represent policy issues; anticipated changes or program departures; and other items of business as requested by the Commissioner, the Associate Commissioner for Research, or the Council itself.

(2) *Review of Bureau of Research Programs.*—The Council periodically reviews, discusses, and advises the Commissioner and the Associate Commissioner for Research on the programs and plans of the Bureau of Research. The Council comments on the strengths and weaknesses of the total program and its parts and makes recommendations for beneficial changes in emphasis and design.

(3) *Review of Bureau of Research Procedures.*—The Council periodically discusses and advises the Commissioner and the Associate Commissioner for Research on the procedures by which the Bureau of Research plans, administers, and evaluates its programs. These procedures include techniques for planning, for administrative control, for processing proposals (including reviewing proposals and contracting and monitoring projects), and for evaluating the effectiveness of research programs.

(4) *Review of Budget Requests, Proposed Allocations of Funds, and Actual Allocations.*—The Council periodically reviews the requested levels of support for research activities and the allocation of these requests (and appropriations) to different parts of the Bureau of Research program. Such reviews take place regularly at sessions scheduled to dovetail with the budgeting and appropriation process.

Procedures

The RAC functions on the basis of agendas submitted to them 10 days in advance of regularly scheduled meetings. The agendas include necessary supporting material. Items are placed on the agenda by the Commissioner, the Associate Commissioner for Research, and the Council. Agenda items may be added at the time of the meeting only with the concurrence of the Council.

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[1] Increase to 15 members was approved by the Secretary of the Department of Health, Education, and Welfare, Aug. 15, 1968.

APPENDIX B.—RESEARCH AND DEVELOPMENT CENTERS

In fiscal year 1968, Cooperative Research support was used for all of the centers listed below, except the two supported under provisions for Vocational Education Research.

Fiscal year established	Name of center, location, and area of inquiry
1964	Learning Research and Development Center, University of Pittsburgh, Pittsburgh, Pa.(Learning research and instructional practices)
	Center for the Advanced Study of Educational Administration, University of Oregon, Eugene (School organization and administration in the societal context)
1965	Center for Research and Development for Cognitive Learning, The University of Wisconsin, Madison (Cognitive learning)
	Center for Research and Leadership Development in Vocational and Technical Education, Ohio State University, Columbus. (Research and development activities, including operation of ERIC clearinghouse on adult and vocational education)
	Center for Research, Development and Training in Occupational Education, North Carolina State University, Raleigh. (Research and development emphasizing southern needs in adult and vocational education)
1966	Research and Development Center in Educational Stimulation, University of Georgia, Athens. (Programs of early and continuous stimulation, 3- to 12-year-olds)
	Research and Development Center in Teacher Education, University of Texas, Austin. (Teacher education)
	Stanford Center for Research and Development in Teaching, Stanford University, Palo Alto, Calif. (Theory and practice of teaching and its effects)
	Center for Research and Development in Higher Education, University of California, Berkeley. (Organization, purposes, and outcomes of higher education)
	Center for the Study of the Evaluation of Instructional Programs, University of California, Los Angeles. (Study of evaluation processes and techniques)
1967	Center for the Study of Social Organization of Schools, The Johns Hopkins University, Baltimore, Md. (Influence of social and administrative organization of schools on learning of students from diverse backgrounds)
1967	*The National Laboratory on Early Childhood Education:* a center-type activity which includes the National Coordination Center and the ERIC Clearinghouse on Early Childhood Education, located at the University of Illinois, Urbana, and coordinated centers located at the University of Arizona, Tucson, the University of Chicago, Cornell University, Ithaca, George Peabody College for Teachers, Nashville, Syracuse University, and the University of Kansas, Lawrence

Fiscal year established	Name of center, location, and area of inquiry
1968	*Educational Policy Research Centers:* Stanford Research Institute, Menlo Park, Calif., and Syracuse University Research Corporation, Syracuse, N.Y. (Using a variety of different forecasting techniques, and premises, these Centers are studying alternative conceptions of relationships between education and society in the future.)

APPENDIX C.—EDUCATIONAL LABORATORIES AND PARTICIPATING STATES

Regional Educational Laboratories supported during fiscal year 1968

Appalachia Educational Laboratory (AEL)
1416 Kanawha Boulevard
Charleston, W. Va. 25325
(West Virginia, and parts of Virginia, Tennessee, Kentucky, Ohio, and Pennsylvania)

Center for Urban Education (CUE)
105 Madison Avenue
New York, N.Y. 10016
(Metropolitan New York City and some neighboring cities, excluding Long Island)

Central Atlantic Regional Educational Laboratory (CAREL)
1200 Seventeenth Street NW.
Washington, D.C. 20036
(District of Columbia, Maryland, and parts of Delaware, Virginia, and West Virginia)

Central Midwestern Regional Educational Laboratory (CEMREL)
10646 St. Charles Rock Road
St. Ann, Mo. 63074
(Eastern Missouri, southern Illinois, and central and western Tennessee and Kentucky)

Cooperative Educational Research Laboratory, Inc. (CERLI)
540 West Frontage Road
Northfield, Ill. 60093
(Indiana, and parts of Illinois, Michigan, and Wisconsin)

Eastern Regional Institute for Education (ERIE)
635 James Street
Syracuse, N.Y. 13203
(Western Pennsylvania, and New York State, except metropolitan New York City)

Education Development Center, Inc. (EDC)
55 Chapel Street
Newton, Mass. 02160
(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)

Far West Laboratory for Educational Research and Development (FWLERD)
Hotel Claremont, 1 Garden Circle
Berkeley, Calif. 94705
(Northern California, and Nevada, except Clark County)

Michigan-Ohio Regional Educational Laboratory (MOREL)
3750 Woodward Avenue
Detroit, Mich. 48201
(Michigan and Ohio)

Mid-Continent Regional Educational Laboratory (McREL)
104 East Independence Avenue
Kansas City, Mo. 64108
(Western Missouri, central Oklahoma, and parts of Kansas and Nebraska)

Northwest Regional Educational Laboratory (NWREL)
710 Southwest Second Avenue
Portland, Oreg. 97204
(Alaska, Idaho, Montana, Oregon, and Washington)

Regional Educational Laboratory for the Carolinas and Virginia (RELCV)
Mutual Plaza
Durham, N.C. 27701
(North Carolina, South Carolina, and southern Virginia)

Research for Better Schools, Inc. (RBS)
1700 Market Street
Philadelphia, Pa. 19103
(Delaware, New Jersey, and eastern Pennsylvania)

Rocky Mountain Educational Laboratory (RMEL)
1620 Reservoir Road
Greeley, Colo. 80631
(Colorado, Wyoming, and portions of Arizona, Idaho, Montana, Kansas, and Nebraska)

South Central Region Educational Laboratory (SCREL)
302 National Old Line Building
Little Rock, Ark. 72201
(Arkansas, Mississippi, and parts of Kansas, Louisiana, Missouri, and Oklahoma)

Southeastern Educational Laboratory (SEL)
3450 International Boulevard
Hapeville, Ga. 30054
(Alabama, Florida, and Georgia)

Southwest Educational Development Laboratory (SEDL)
800 Brazos Street
Austin, Tex. 78767
(Parts of Texas, and southern Louisiana)

Southwest Regional Laboratory for Educational Research and Development (SWRL)
11300 LaCienega Boulevard
Inglewood, Calif. 90304
(Southern California, southern Nevada, and western Arizona)

Southwestern Cooperative Educational Laboratory (SWCEL)
117 Richmond Drive NE.
Albuquerque, N. Mex. 87106
(New Mexico, and portions of Arizona, Oklahoma, and Texas)

Upper Midwest Regional Educational Laboratory (UMREL)
1640 East 78th Street
Minneapolis, Minn. 55423
(Iowa, Minnesota, North Dakota, South Dakota, and part of Wisconsin)

APPENDIX D.—ERIC CLEARINGHOUSES

The network of ERIC Clearinghouses and their locations is given below, with subject areas shown. In fiscal year 1968, 12 used Cooperative Research support, while seven used support from other appropriate authorizations.

ADULT EDUCATION
Syracuse University
107 Roney Lane
Syracuse, N.Y. 13210

COUNSELING AND PERSONNEL SERVICES
University of Michigan
611 Church Street
Ann Arbor, Mich. 48104

DISADVANTAGED
Teachers College
Columbia University
New York, N.Y. 10027
(At Yeshiva University until September 1968)

EARLY CHILDHOOD EDUCATION
University of Illinois
805 West Pennsylvania Avenue
Urbana, Ill. 61801

EDUCATIONAL ADMINISTRATION
University of Oregon
Eugene, Oreg. 97403

EDUCATIONAL FACILITIES
University of Wisconsin
606 State Street
Madison, Wis. 53703

EDUCATIONAL MEDIA AND TECHNOLOGY
Institute for Communication Research
Stanford University
Stanford, Calif. 94305

EXCEPTIONAL CHILDREN
Council for Exceptional Children, NEA
1201 Sixteenth Street NW.
Washington, D.C. 20036

HIGHER EDUCATION
George Washington University
Washington, D.C. 20005

JUNIOR COLLEGES
University of California at Los Angeles
405 Hilgard Avenue
Los Angeles, Calif. 90024

LIBRARY AND INFORMATION SCIENCES
University of Minnesota
2122 Riverside Avenue
Minneapolis, Minn. 55404

LINGUISTICS
Center for Applied Linguistics
1717 Massachusetts Avenue NW.
Washington, D.C. 20036

READING
Indiana University
204 Pine Hall
Bloomington, Ind. 47401

RURAL EDUCATION AND SMALL SCHOOLS
Box AP, University Park Branch
New Mexico State University
Las Cruces, N. Mex. 88001

SCIENCE EDUCATION
Ohio State University
1460 West Lane Avenue
Columbus, Ohio 43221

TEACHER EDUCATION
American Association of Colleges for Teacher Education
1156 15th Street NW.
Washington, D.C. 20005
(Formerly, School Personnel, at City University of New York)

TEACHING OF ENGLISH
National Council of Teachers of English
508 South Sixth Street
Champaign, Ill. 61820

TEACHING OF FOREIGN LANGUAGES
Modern Language Association of America
62 Fifth Avenue
New York, N.Y. 10011

VOCATIONAL AND TECHNICAL EDUCATION
Ohio State University
980 Kenny Road
Columbus, Ohio 43210

U.S. GOVERNMENT PRINTING OFFICE : 1969—O-351-760

UNITED STATES
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WASHINGTON, D.C. 20402

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OE-12043